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New Zealand Department of Agriculture.

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POULTRY AND EGGS

FOR

MARKET AND EXPORT.

BY

D. D. HYDE, CHIEF POULTRY EXPERT.

Published by direction of the Hon. T. Y. Duncan, Minister of Agriculture.

WELLINGTON, N.Z.
BY AUTHORITY: JOHN MACKAY, GOVERNMENT PRINTER.
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New Zealand Department of Agriculture.

JOHN D. RITCHIE, Secretary.

POULTRY AND EGGS

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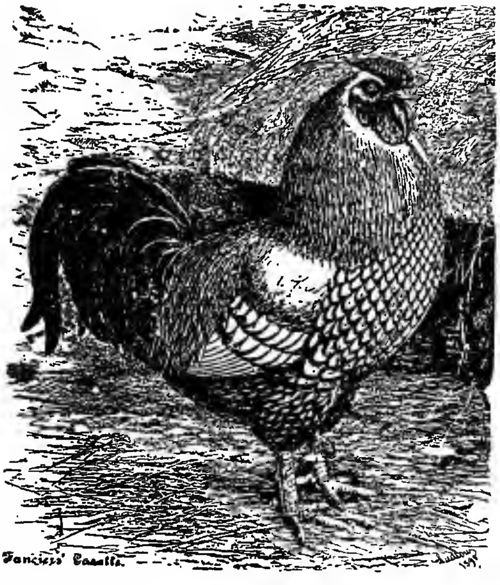
MARKET AND EXPORT.



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POULTRY AND EGGS FOR MARKET AND EXPORT.

INTRODUCTION.

This pamphlet is intended as a handy book of reference for farmers and others, and describes up-to-date methods of poultry-keeping. Those who will adhere strictly to the instructions herein set forth will avoid many mistakes that are too frequently made by the novice. It is the writer's earnest desire that this little work will prevent beginners from spending money unnecessarily. It must be noted that there is a good deal of knowledge needed to become a successful poultry-breeder. There are so many details about it that an apprenticeship should be served, the same as in any other business; and it is advisable that any inexperienced person wishing to breed poultry on anything like a large scale should spend at least six weeks at one of the Government poultry-stations. Provision has now been made for that purpose, and particulars of the conditions on which students are received at the stations will be found on page 34.

The poultry industry is rapidly extending in New Zealand, and yet the orders received from South Africa far exceed the supply. It is, however, only a matter of time till we shall be able to supply the demand, as we are undoubtedly on the eve of great developments.

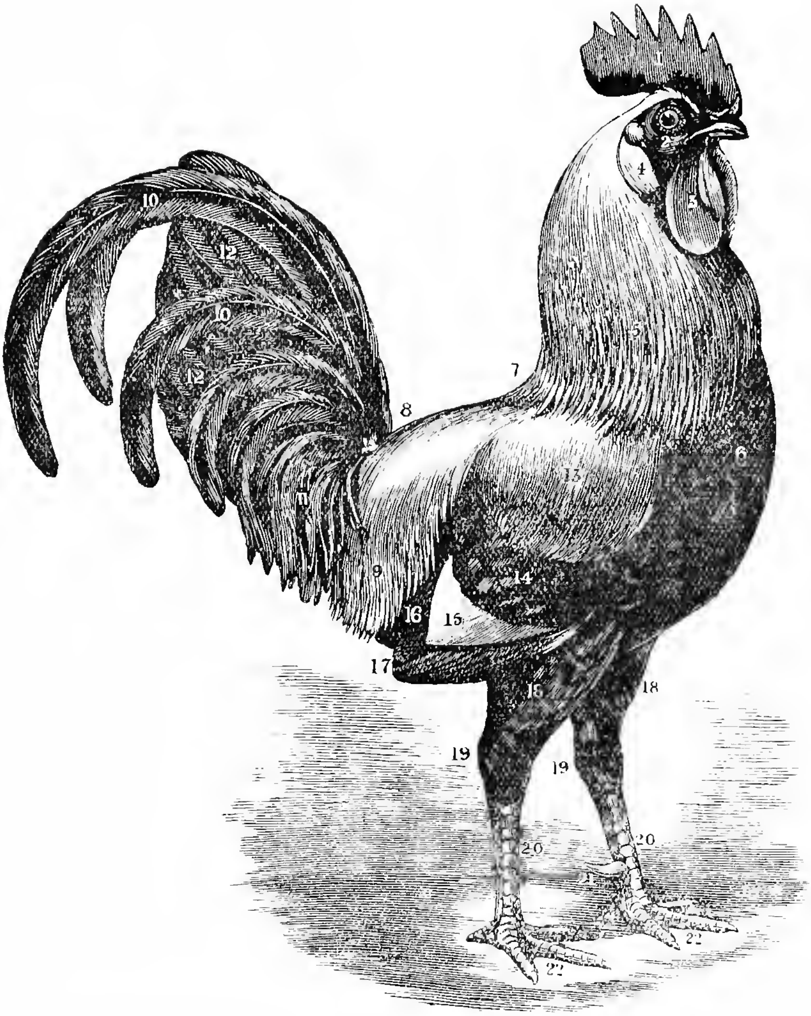
Within the last three years the increase of poultry-raising has been most marked. The business is now being conducted by many on a much larger scale than hitherto attempted here. Results will depend, as in all commercial undertakings, upon the knowledge, enterprise, and skill of those engaged in it.

I look forward with great confidence to the future of this industry, and feel that as poultry-keepers become better acquainted with what is necessary for the proper care of their stock the efforts that are now being made to educate them in that direction will be more and more appreciated.

Poultry-keeping will help the farmer by giving him steady cash returns if the business is rightly managed, and no other class of stock will give the same profit—pound for pound invested—as poultry will. Dairying and poultry go hand-in-hand, as also do poultry, fruit, and bee culture. Another essential point in favour of poultry-raising: by using movable houses you are continually enriching your farm, and in many instances bringing the soil from its worn-out condition to one of fertility. Moreover, it is an excellent practice to keep fowls in the orchard, excepting when the fruit is ripening upon the trees. They require insect food, and will range the whole place for it; not a grub of any description but will become a victim to the fowls.

Remember, poultry-keeping is full of details: attend to these and success must follow.

D. D. Hyde,
Chief Poultry Expert.



THE ABOVE ILLUSTRATION, SHOWING THE TECHNICAL POINTS OF A FOWL, WILL BE OF ASSISTANCE TO POULTRY-BREEDERS.

1. Comb.
2. Face.
3. Wattles.
4. Ear-lobe.
5. Hackle.
6. Breast.
7. Back.
8. Saddle.
9. Saddle-hackle.
10. Sickles.
11. Tail-coverts.
12. True tail-feathers.
13. Wing-bow.
14. Wing-coverts, forming the bar.
15. Secondaries, the lower ends forming the wing or lower butts.
16. Lower wing-butts.
17. Primaries. Hidden by secondaries when the wing is closed.
18. Thighs.
19. Hocks.
20. Legs or shanks.
21. Spur.
22. Toes or claws.

POULTRY *V.* OTHER FARM PRODUCTS.

The following table of exports over the Motueka Wharf during the year ending the 1st October, 1904, was compiled by the wharfinger. It indicates in a forcible manner the position occupied by poultry amongst the farm products of that district:—

Product.	Value. £	s.	d.	Product.	Value. £	s.	d.
Fruit	16,428	17	0	Sheep-skins ..	122	15	0
Hops	8,790	0	0	Pigs	91	11	0
Poultry and eggs ..	*6,702*	*5*	*0*	Oats	91	0	0
Wool	6,457	0	0	Lard	87	14	0
Butter	6,109	0	0	Peas	45	0	0
Bacon	3,020	0	0	Swedes	36	17	0
Flax	2,620	0	0	Bran	26	0	0
Sheep	1,199	0	0	Hides	24	15	0
Chaff	723	16	0	Melons	22	10	0
Timber	509	10	0	Carrots	14	10	0
Flour	437	15	0	Tow	12	0	0
Barley	426	0	0	Honey	5	0	0
Potatoes.. ..	354	5	0	Onions	4	0	0
Nuts	312	0	0				
Jam	141	0	0		£54,814	0	0

THE AMERICAN POULTRY CENSUS.

The last United States census report shows that of the 5,739,657 farms in the United States, 5,096,252 reported poultry. The total number of fowls three months old and over reported was as follows: Chickens, including guinea-fowls, 233,598,085; turkeys, 46,599,367; geese, 5,676,863; ducks, 4,807,358. The numbers of nearly all of these classes of poultry are smaller than were reported in 1890, owing to the fact that in 1890 all fowls of whatever age were reported, while in 1900 only those three months old and over were reported. The eggs produced in 1899 were 1,293,819,186 dozen, against 819,722,916 dozen in 1889. An increase in the number of eggs produced, rather than an increase in the number of different kinds of fowls, marks the progress of this branch of the industry. The value of poultry on hand on the 1st June, 1900, was $85,794,996; the value of poultry raised in 1899 was $136,891,877; and the value of eggs produced in 1899 was $144,286,158. The total income derived by the farmers from their poultry industry in 1899, representing the total value of the eggs produced as well as the poultry raised, was $281,178,035.

POULTRY *V.* OTHER FARM PRODUCTS OF THE UNITED STATES.

The following is an extract from the United States Census Bulletin of 1900:—

	$
Value of poultry and eggs	281,178,035
" swine	232,027,707
" oat-crop	217,098,584
" milk	184,842,292
" sheep	170,336,972
" potato-crop	98,387,614
" butter	86,606,446
" tobacco-crop	56,933,033
" wool-crop	47,723,739
" sugar-cane and products... ...	39,304,632

POULTRY IN CANADA.

The following figures are taken from the Statistical Year-book of Canada :—

Number of birds killed for export and local consumption in 1901, 7,063,597.

The census for the same year gives the following : 584,569 turkeys ; 395,997 geese ; 290,755 ducks ; 15,562,084 fowls.

VALUE OF POULTRY PRODUCTS OF AUSTRALIA AND NEW ZEALAND IN 1902. (*Coghlan.*)

	£
New South Wales	732,000
Victoria	716,000
New Zealand (estimated)	471,000
South Australia	343,000
Queensland	305,000
West Australia	178,000
Tasmania	105,000
	£2,850,000

In 1902 South Australia's export of eggs was valued as follows :—

	£
To West Australia	73,710
„ New South Wales	27,168
„ Victoria	4,585
	£105,463

CONSUMPTION OF POULTRY PRODUCTS IN GREAT BRITAIN.*

VALUES.

	Eggs consumed.	Poultry and Game consumed.	Totals.
	£	£	£
Produce of Great Britain ...	4,600,000	2,700,000	7,300,000
Irish produce	1,900,000	400,000	2,300,000
Foreign and colonial produce	6,617,619	1,203,086	7,820,705
	£13,117,619	£4,303,086	£17,420,705

ESTIMATED NUMBER OF EGGS CONSUMED.

Produce of Great Britain	1,261,500,000
Irish produce	600,000,000
Foreign and colonial produce	2,369,868,000
	4,231,368,000

---

* Ireland, being an exporting country, the consumption there is not included.

ESTIMATED WEIGHTS OF EGGS AND FOWLS CONSUMED.

	Tons.
Eggs	250,000
Poultry	65,000
	315,000

IMPORTS OF EGGS AND POULTRY INTO GREAT BRITAIN.

"It is interesting," says Mr. Brown in his book on poultry, "to show the rapid rise in the imports of these two products from abroad since 1864, and as this is largely a question of money we confine the subjoined table to values only, as these are fairly representative of the quantities, though there have been variations in the prices of the respective products."

VALUES OF IMPORTS.

	Eggs. £	Poultry and Game. £
1864	835,028	...
1870	1,105,653	...
1875	2,559,860	...
1880	2,335,451	...
1885	2,931,237	...
1890	3,428,802	497,858
1895	4,003,440	605,166
1900	5,406,141	1,010,327
1903	6,617,619	1,203,086

These figures show that the imports of eggs alone have advanced upwards of 700 per cent. in forty years, and that there is a steady increase constantly going on. The reason why the imports of poultry and game have not been included in the above table until 1890 is that previous to 1886 rabbits were included with them. But it may be mentioned that the total imports of poultry, game, and rabbits in 1864 only amounted to £131,179. Of the poultry and game imports in 1903 it is probable that not more than one-tenth is the game-value.

IMPORTS OF POULTRY AND GAME INTO GREAT BRITAIN DURING 1903.

	Value. £
From Russia	324,087
" Belgium	275,175
" France	254,888
other countries	348,938
	£1,203,086

OCEAN FREIGHTS.

The charge will, until further notice, be 1s. 6d. per cubic foot; so that fowls and ducks can be landed in England and South Africa at about 6½d. per head, inclusive of all charges for services rendered by the Department of Agriculture and the ship. The cases at present used by the Department hold twelve, fifteen, or eighteen fowls or ducks, according to the grade, and twenty-three of these cases measure a ton.

GOVERNMENT EXPORT DEPOTS.

The Department of Agriculture has depots at Auckland, Wellington, Christchurch, and Dunedin for the preparation of poultry and eggs for export and local consumption. At each of these centres suitable buildings have been erected, and a qualified Grader (who devotes himself exclusively to the Department's business) is in attendance.

CONDITIONS OF RECEIPT AT GOVERNMENT EXPORT DEPOTS.

It should be distinctly understood that the Department of Agriculture *does not purchase* poultry for export. It will, however, receive chickens, fowls, ducklings, ducks, goslings, geese, turkeys, or eggs, *and prepare them* for export on the following conditions:—

Chickens should be from three to five months old, and in good condition.

Fowls (hens), any age, should have clean legs—*i.e.*, free from scale—and in good condition.

In order to insure even grades and to meet the wishes of the South African buyers, it has been decided to establish four distinct grades for chickens and four for fowls. These grades will be known as the A, B, C, and D grades. The weights will be—

A grade, 2½ lb. and under 3 lb.
B grade, 3 lb. and under 3½ lb.
C grade, 3½ lb. and under 4 lb.
D grade, 4 lb. and over.

Ducklings should be from ten to twelve weeks old, weighing as follows:—

C grade, 3½ lb. and under 4 lb.
D grade, 4 lb. and over.

The younger birds give better prices. White ducklings are most admired in the English market.

Ducks:—

C grade, 3 lb. and under 4 lb.
D grade, 4 lb. and over.

They should not be sent to London.

(Note.—There is no A or B grade for ducklings and ducks, as the weights would be too low.)

Goslings should not be over six months old, and will be graded as follows:—

A grade, 8 lb. and under 10 lb.
B grade, 10 lb. and over.

Geese will be graded similarly.

Turkeys should not be over ten months old. If young, the heavier the bird is the better the price that can be obtained in proportion.

The gobblers will be graded—

A grade, 12 lb. and under 15 lb.
B grade, 15 lb. and over.

Hens—
A grade, 8 lb. and under 10 lb.
B grade, 10 lb. and over.

General.—Birds must be sent alive to the depot, to arrive not later than Thursday of each week, as they must be killed, plucked, packed, and delivered at the cool-store by 1 o'clock on Saturday.

The packages must be addressed to the Department of Agriculture, and marked with the words " Poultry for Export " and with the name of the sender.

An advice-note with full particulars of the consignment should be posted to the Government Poultry-grader prior to the despatch of the birds, and should state the name of the shipping agent, if any.

The Department will receive, grade, kill, pluck, prepare, supply cases for, pack, and freeze the birds, and, if necessary, store them for a month (after that period the shipper will have to pay any additional freezing charges), at the following uniform rates :—

Chickens, fowls, ducklings, and ducks, 4d. each.
Geese and turkeys, 8d. each.

The Department reserves to itself the right to reject any bird in poor condition, or otherwise unsuitable, and all birds rejected must be at once removed from the depot by the owner or his agent.

The Department will pay railage or steamer-freight to the depot on all birds accepted for export. The freight, railage, or other charges on rejected birds will, however, be charged to the owner.

Eggs.—In ordinary seasons these can be shipped in cool-chamber from September to January for London, and at any time for South Africa, and will be received, graded, and packed at a uniform charge of 2d. per dozen, cases included. Eggs for this purpose must weigh not less than 2 oz. each, and must be newly laid; any suspicious or dirty ones will be rejected. As already stated, brown-shelled eggs are preferred on the London market, but white ones find most favour in South Africa. All rejected eggs must at once be removed from the depot by the owner or his agent.

Best Time for Shipping.—Chickens, ducklings, and goslings, February to May; turkeys, September and October (to reach London for Christmas markets); eggs, September to January. There is no recognised season in South Africa; poultry and eggs can be sent there at any time of the year.

Best Numbers to send.—The following are the numbers usually packed in a case, and senders would do well to regulate their consignments accordingly :—

Chickens and fowls—
A grade, 18.
B grade, 15.
C grade, 15.
D grade, 12.

Ducklings and ducks, 15.
Goslings and geese, 10.
Hen turkeys, 8.
Cock turkeys, 4.
Eggs, thirty dozen.

Shipping Arrangements.—Early application for shipping-space is necessary. Twenty-three cases of poultry, or seventeen cases of eggs, measure one ton, cubic. The owner must make his own shipping arrangements, and pay cost of receiving, grading, &c., before shipment.

Advances.—Several firms in the colony have intimated their willingness to advance against shipments. Particulars will be furnished on application to the Chief Poultry Expert, Department of Agriculture, Wellington.

PLUCKING POULTRY FOR LOCAL CONSUMPTION AT GOVERNMENT EXPORT DEPOTS.

In accordance with the request of several firms, the Department of Agriculture has arranged for the Graders in charge of its export depots to undertake the work of killing and plucking (but not dressing) poultry for local consumption.

The conditions on which the work will be done are as follows:—

The birds are to be delivered alive to the Grader, at the expense of the owner, between the hours of 8 a.m. and 4 p.m. on any day except Saturday and Sunday. A receipt will be given to the person who delivers them.

He will be advised by the Grader as to the time they will be ready for removal, and the owner must take delivery as soon as possible after the time stated. The Department will not be responsible for poultry that is ready for removal but is left at the depot after 5 p.m. on the day on which delivery was to be taken.

The charges for killing and plucking will be—

4d. per pair for fowls.
5d. per pair for ducks.
8d. per pair for geese or turkeys.

The feathers to remain the property of the Department. The minimum charge for each consignment will be 2s.

All charges are payable to the Department at its local office on receipt of debit note.

Cases for the removal of the poultry from the depot can be supplied to the owners at cost-price. If cases are required the Grader should be advised when the poultry is being delivered at the depot.

Poultry of any quality can be dealt with under this arrangement.

SUMMARY of POULTRY and EGGS TREATED at the Government Depots Year ending 31st March, 1904.

Month.	For Export.				For Local Consumption.				Total Poultry for Export.	Total Poultry for Local Consumption.	Grand Total.	Eggs.
	Fowls and Chickens.	Ducks and Ducklings.	Geese.	Turkeys.	Fowls.	Ducks.	Geese.	Turkeys.				
					AUCKLAND.							
April, 1903 ..	559	126	..	..	..	..	..	..	685	..	..	..
May, „ ..	..	24	..	..	65	..	..	..	24	65	..	..
July, „ ..	144	..	..	..	283	39	..	13	144	385	..	..
Aug., „ ..	..	..	..	..	47	..	..	8	..	55	..	..
Sept., „ ..	..	..	..	..	84	4	..	..	..	88	..	..
Nov., „ ..	..	..	..	..	89	11	..	9	..	109	..	..
Dec., „ ..	..	..	..	..	268	49	35	10	..	362	..	..
Feb., 1904 ..	..	..	..	..	122	12	..	..	..	134	..	..
Totals for year ..	703	150	..	..	958	115	35	40	853	1,148	2,001	..
					WELLINGTON.							
April, 1903 ..	60	..	..	..	..	..	..	..	60	..	..	..
May, „ ..	30	..	..	..	..	..	..	..	30	..	..	..
Aug., „ ..	391	203	..	..	..	..	..	..	594	..	..	..
Feb., 1904 ..	15	..	..	..	..	..	..	..	15	..	..	..
March, „ ..	15	..	..	..	..	..	..	..	15	..	..	..
Totals for year ..	511	203	..	..	..	..	..	..	714	..	714	..
					CHRISTCHURCH.							
April, 1903 ..	641	216	..	..	331	..	..	..	857	331	..	..
May, „ ..	714	72	..	..	244	..	..	..	786	244	..	..
June, „ ..	480	12	..	8	136	..	..	..	500	136	..	..
July, „ ..	330	..	..	9	17	..	..	..	339	17	..	..
Aug., „ ..	15	..	..	..	..	..	..	..	15	..	..	..
Sept., „ ..	29	..	..	..	25	..	..	8	29	33	..	..
Oct., „ ..	..	..	..	..	25	..	..	..	..	25	..	..
Nov., „ ..	..	..	..	..	..	..	..	..	..	6	..	..
Dec., „ ..	120	..	..	..	123	14	..	..	120	137	..	..
Jan., 1904 ..	15	..	..	..	..	..	..	..	15	..	..	..
Feb., „ ..	330	300	..	..	163	43	..	..	630	206	..	..
March, „ ..	1,707	480	..	..	1,494	263	..	3	2,187	1,760	..	..
Totals for year ..	4,381	1,080	..	17	2,558	326	..	11	5,478	2,895	8,373	50,910
					DUNEDIN.							
April, 1903 ..	579	482	9	..	..	..	..	..	1,070	..	..	..
May, „ ..	888	303	..	..	..	..	..	..	1,191	..	..	..
June, „ ..	683	198	..	..	..	..	..	..	881	..	..	..
July, „ ..	467	25	5	18	..	..	..	..	515	..	..	..
Aug., „ ..	220	45	12	91	..	..	..	..	368	..	..	..
Jan., 1904 ..	304	72	..	..	..	..	..	..	376	..	..	..
Feb., „ ..	745	507	..	..	227	391	20	2	1,252	640	..	..
March, „ ..	1,544	1,703	6	7	125	90	..	..	3,260	215	..	..
Totals for year ..	5,430	3,335	32	116	352	481	20	2	8,913	855	9,768	58,052
Totals for all depots for year	11,025	4,768	32	133	3,868	922	55	53	15,958	4,898	20,856	108,962

In addition, 31,200 eggs were packed and stored at Patea.

The Christchurch Meat Company packed and stored 156,480 eggs and 27,171 head of poultry.

Large quantities were also treated by other private firms, the exact figures for which are not available.

TREATMENT OF POULTRY TRAVELLING TO THE EXPORT DEPOT OR TO MARKET.

There are one or two matters connected with the carriage of poultry to market and their treatment there that need attention.

CRATES.

The class of crate that is very frequently used for railway transit is, to put it mildly, unsuitable. An old box with a piece of wire netting round it seems the ideal of some poultry-senders. The result is that the box sometimes comes to pieces in transit, and the fowls escape; or the floor-battens are loosened, and the fowls' feet are jammed in between and their legs broken. Then, again, there is frequently a considerable quantity of filth on the bottom of these boxes, and the birds are sometimes cooped for days. As regards crates, nearly every poultry-salesman has a number of these of a similar pattern to the one shown in illustration on page 13, and if application is made by intending senders these crates are loaned for a nominal sum.

In Melbourne the poultry-salesmen supply crates free of cost, and before being again sent out each crate is thoroughly cleansed and disinfected. This is insisted on by the railway authorities, who refuse to forward crates that are in a dirty condition.

FOOD AND WATER.

On arrival at the end of a long railway journey poultry are frequently allowed to remain several hours on the platform without food or water, and even when prompt delivery is taken it often happens that no provision is made at the saleroom for supplying their wants. This is a matter that could be easily attended to by every poultry-salesman, and senders will be acting wisely if they avoid any firm that neglects to provide these facilities. It is a well-known fact that if birds are deprived of water for any length of time before being killed the flesh assumes a dark, unwholesome colour. At the Government depots provision is made against this; but, as stated, similar care is not always shown by salesmen who handle poultry for local consumption.

HINTS ABOUT SENDING POULTRY TO THE EXPORT DEPOTS OR TO MARKET.

Don't fail to have your birds in good condition when sent—that is the cardinal point.

Don't use filthy old boxes with covers of wire netting; ask your buyer or agent to send you standard crates, and insist on their being clean and in good repair; state whether you want fowl, duck, goose, or turkey crates.

Don't forget to put hay or straw on the bottom of the crates, so that your birds will be kept clean and comfortable.

Don't put more than twenty ducks or ducklings, or twenty-five hens or cockerels, in each crate; put fewer if the birds are large.

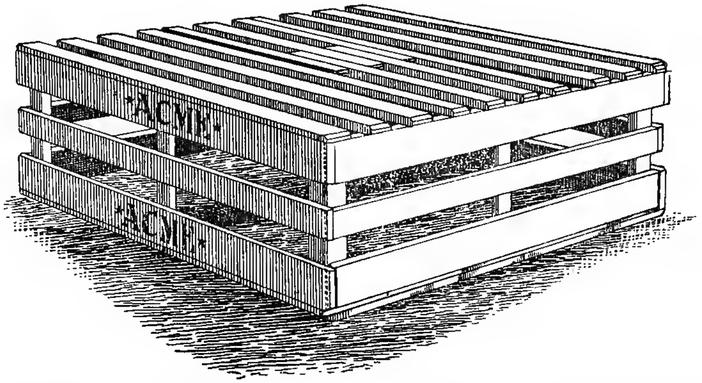
Don't put more than ten medium-sized turkeys or geese in each crate; put fewer if the birds are large.

Don't send turkeys and geese in the same crate with ducks and fowls; turkeys and geese need special crates.

If you are sending a few of each, separate the turkeys and geese from the fowls and ducks by tacking a bag or couple of boards across the crate.

Don't send a crate of ducklings without a similar division; this will prevent them crowding into one corner and smothering or otherwise injuring the weak ones.

CRATE FOR TRAVELLING.



This shows a crate suitable for sending live fowls to the export depot or to market. Size: 4 ft. long, 2 ft. 6 in. wide, 1 ft. 4 in. high. Crates for geese and turkeys should be 4 in. higher. The floor should be close-boarded; the top, sides, and ends as illustrated.

Don't use for fowls or ducks any box or crate that is less than 16 in. in height. Turkeys and geese need 20 in.

Don't nail the sliding door of the crate so that the nails cannot be easily extracted on arrival.

Don't forget to ask your buyer or agent for his printed address-cards. Affix these securely to the ends or sides of the crate; if they are put on the top they are liable to be torn off in transit.

Don't use crates or cards belonging to another firm, or your consignment may go astray.

Don't forget to fill in the address-cards with your full name and address, and the number of birds consigned; this will enable the receiver to check pilfering and mistakes in counting.

Don't forget to post, one mail in advance, a letter giving full particulars of your consignment. If the birds are for export, send two letters—one to the Government Poultry-grader, and one to your agent.

Don't send consignments by rail without filling in a railway consignment note. Don't let your carter sign his name on the consignment note. Your own name and address is what is wanted.

Don't send the birds at the week-end, especially if they are for export. Poultry for that purpose must reach the Grader by Thursday at the latest, as they must be dressed, packed, and delivered at the cold-store not later than midday on Saturday.

Don't send consignments on the eve of Christmas and Easter holidays. You will obtain equally good prices for your accepted birds, and probably better for your rejects, by sending them the week before or after.

Don't neglect the advice in the two foregoing paragraphs, or you may find yourself debited with railage and feed and attendance charges, through the Grader being compelled to refuse to take delivery owing to inability to prepare the birds and deliver them at cold-store by the specified time.

Don't keep your old hens over the moult; send them in as soon as they finish their second laying season.

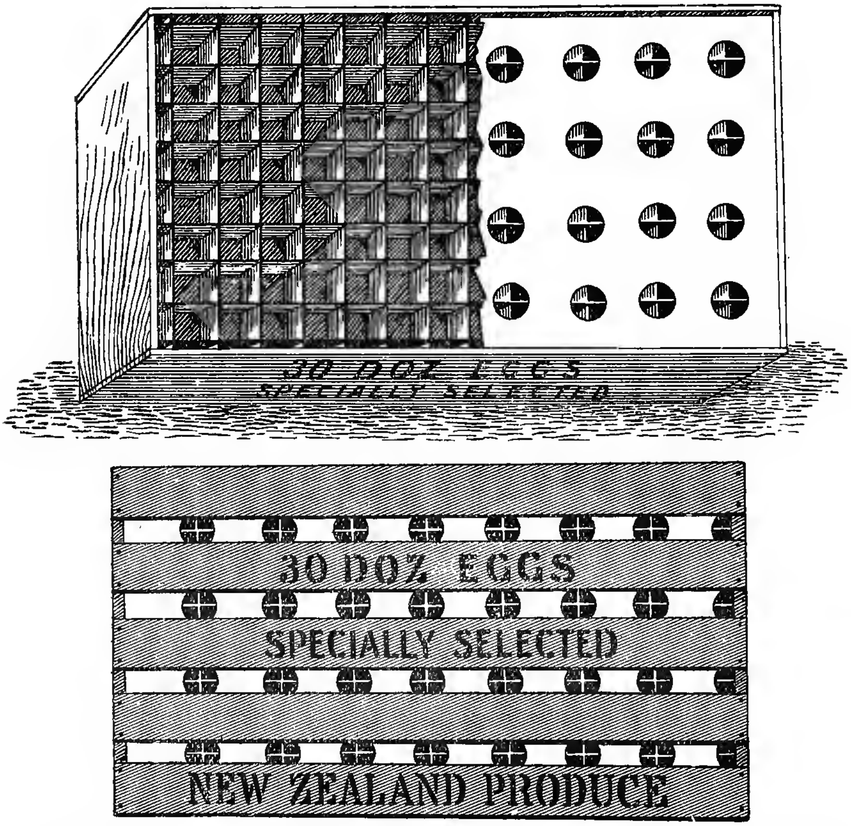
Don't send away pullets amongst old hens, or you will find a scarcity of eggs the following season.

Don't keep your cockerels longer than five months; the longer you keep them after that the smaller their value and the greater the amount you will have spent for food, &c.

Don't send small chickens or small ducklings, unless by arrangement with your buyer or agent. Send only birds that fill export requirements as regards weight and condition (see page 8), then you will not have trouble about rejects and railage thereon.

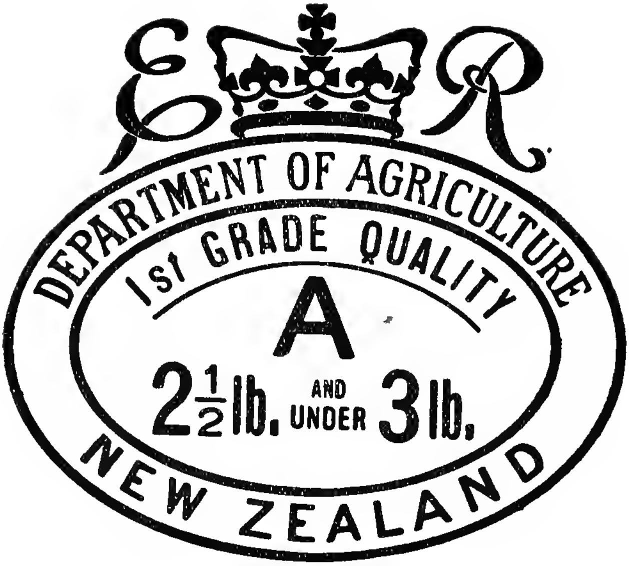
Don't forget to pay particular attention to all these points; by observing them you will be benefiting yourself and the export trade generally.

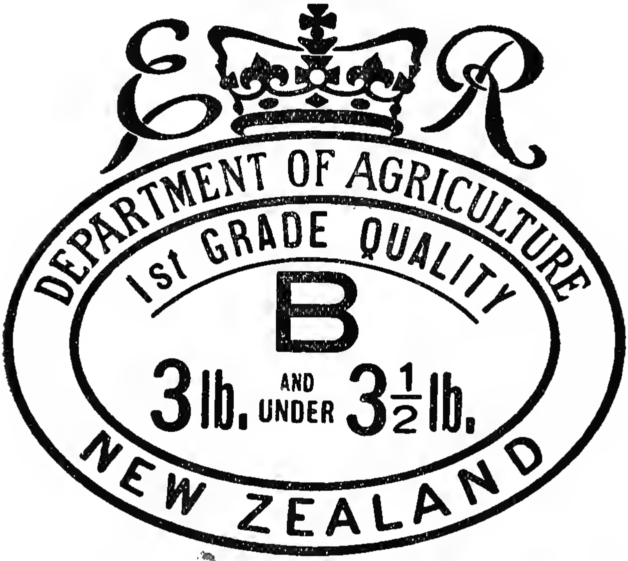
METHOD OF PACKING EGGS.

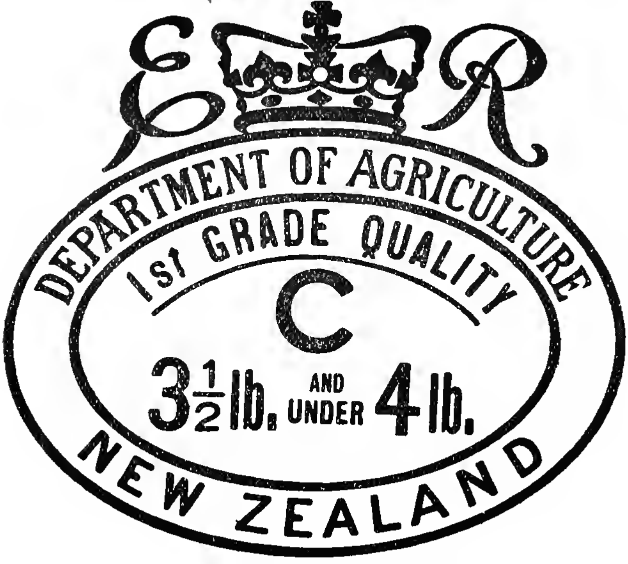


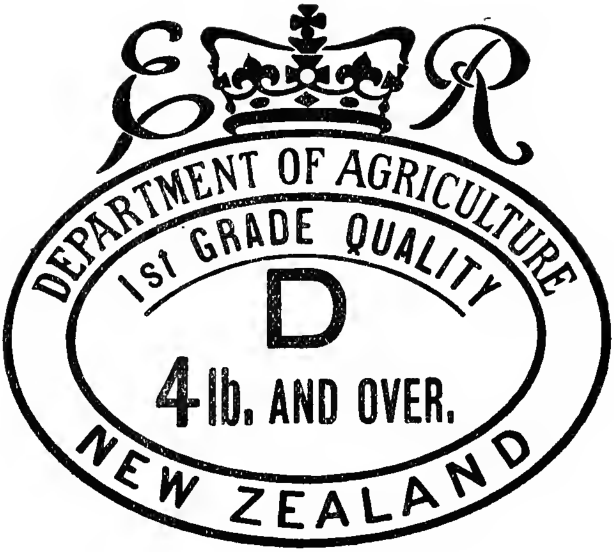
The above blocks show the cases used by the Department when packing eggs for cool-storage. For export a similar case is used, but the cardboard sheets are not perforated, and a husk packing is used.

Each case of poultry for export will bear one of the following stamps, according to weight:—


E R
DEPARTMENT OF AGRICULTURE
1st GRADE QUALITY
A
2½ lb. AND UNDER 3 lb.
NEW ZEALAND


E R
DEPARTMENT OF AGRICULTURE
1st GRADE QUALITY
B
3 lb. AND UNDER 3½ lb.
NEW ZEALAND


E R
DEPARTMENT OF AGRICULTURE
1st GRADE QUALITY
C
3½ lb. AND UNDER 4 lb.
NEW ZEALAND



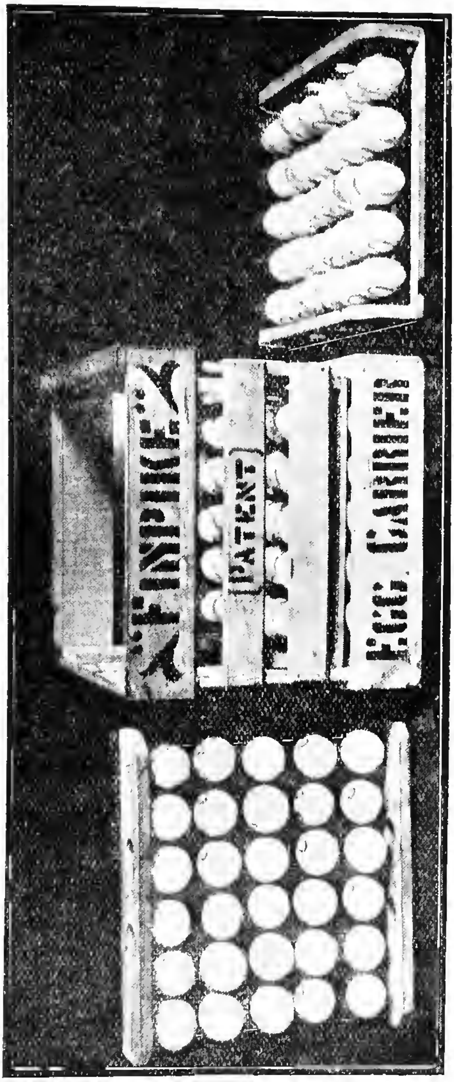
NEW ZEALAND'S CONSUMPTION OF EGGS.

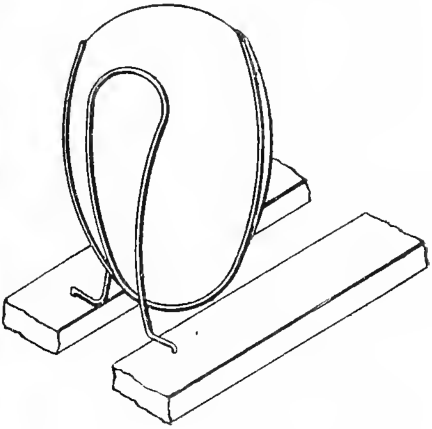
In a return published by the Municipality of Paris, it is stated that the average consumption of eggs in that city was, in 1898, equal to 212 per head of the population. My own calculation is that the number of eggs used per head of the population is quite as large in New Zealand as in Paris. The population of this colony, according to the statistical returns last published, is 815,820, so that the consumption of eggs would equal 172,953,840. These figures will be interesting to producers, as showing that the poultry product in this colony is not so small an item as is generally supposed.

PRIVATE TRADE.

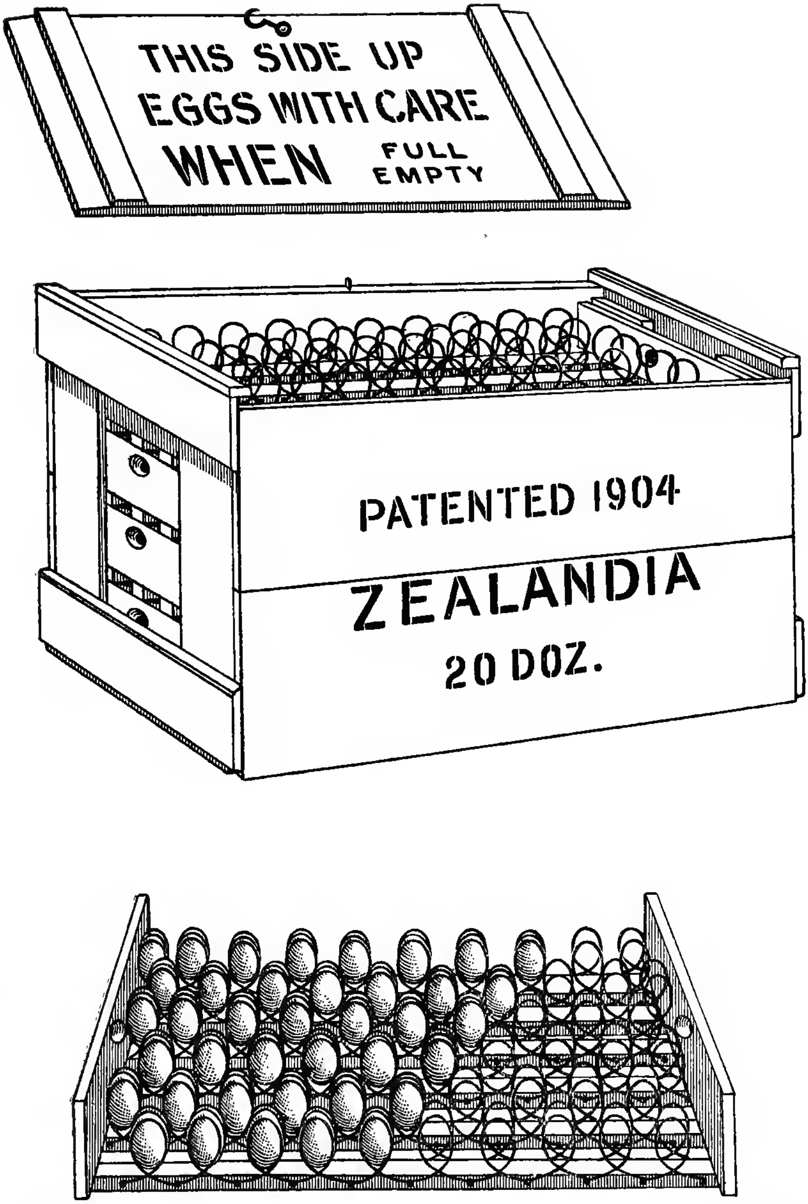
Cater for a private trade, in order to get the maximum price; bear in mind that only the best poultry and eggs should be offered. The latter must be clean and quite free from dirty stains; to insure this, eggs must be gathered regularly, and ample nest-boxes provided with clean hay, straw, or shavings in them. Pine-needles are also excellent for this purpose, as they help to check vermin. When the product is offered in an inviting condition it not only brings a higher price, but there is more consumed. Fish, onions, or any strong-smelling food should only be given in small quantities to hens, as they have a detrimental effect on the flavour of the eggs.

EGGS FOR MARKET.





"The Finpike Egg carrier," a new invention. This contrivance can be recommended, as it is essentially a safe egg-carrier, and greatly minimises the risk of breakages during transit.



The "Zealandia Egg carrier," patented by G. L. Robertson. A new local invention designed for the safe carriage of eggs, made in various sizes, should prove a boon to egg-suppliers.

The collection and sale of eggs should be conducted on up-to-date lines. It should be known to all poultry-keepers that the shell of an egg is porous, and consequently eggs should be kept in a cool place. It is a great mistake to allow eggs to remain scattered about; they should be gathered twice a day. Eggs that are allowed to accumulate in nests get covered with dirt, which has a very prejudicial effect on the price. Consumers who can obtain guaranteed fresh eggs will readily pay higher prices than those usually quoted, and householders know the difficulty there is in obtaining good fresh eggs. Then, again, in my opinion, eggs should be sold by weight. If consumers could buy guaranteed fresh eggs, graded according to size and colour, there would be more consumed, and further impetus given to the industry. The fact that fresh eggs weigh more than stale ones would also be an inducement to the producer to bring them in fresh, and a guide to the purchaser. The average weight of fresh eggs should be eight to the pound. Again, how often do you find shopkeepers filling their shop-windows with eggs packed on straw or chaff, with a blazing sun pouring on the produce, daily deteriorating the value of it? The shell being porous, a tasteless substance should be used for packing.

TESTING FRESHNESS OF EGGS.

The age of eggs can be determined in the following manner:—

Dissolve 2 oz. of salt in one pint of water. A new-laid egg placed therein will sink to the bottom. An egg three days old will be suspended in the liquid. Beyond that age it will rise to the surface; the older it is the higher it will rise out of the solution.

The reason of this is that, the shell being porous, evaporation is constantly taking place from the day the egg is laid. The air-space in a new-laid egg is very small. As evaporation continues the contents shrink, and the air-space expands. The air-space in an egg a month old occupies about one-eighth of the total space within the shell.

SELLING EGGS AND POULTRY BY WEIGHT.

I am surprised that poultry-breeders do not take some action in this matter. Selling poultry and eggs by weight would quickly revolutionise and improve the class and quality of hens kept. At the present time the consumer pays as much for eggs that weigh twelve to the pound as for those that weigh eight. The same conditions apply to poultry. One producer is practically paid no more for a bird that weighs 6 lb. than another is for one weighing 3 lb. Not so the consumer; he has to pay for size, and the middleman reaps the profit. But old customs die hard, and this one is no exception. A change for the better is, however, coming for the producer, and the export trade will be largely responsible for it.

I am pleased to state that there are now several firms in the North Island that are buying young poultry by weight, and I trust ere long the practice will become universal.

AVERAGE WHOLESALE PRICES FOR POULTRY AND EGGS IN NEW ZEALAND DURING 1904.

—	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
AUCKLAND MARKET.—Supplied by Messrs. A. Tooman and Co., R. Arthur and Co., and E. A. Perkins and Co.												
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Chickens,* per pair	5 4	5 2	5 0	4 10	4 8	5 2	5 6	6 0	6 6	6 4	4 8	5 0
Hens, "	4 0	3 6	3 4	3 2	3 6	3 8	4 0	4 6	5 3	4 0	3 6	4 0
Ducks, "	3 10	3 6	3 8	3 8	3 10	4 6	5 0	5 6	5 0	4 6	4 0	4 6
Turkeys (cocks), per pair	16 0	14 0	14 0	12 6	14 6	15 0	16 0	18 0	18 0	18 0	17 0	20 0
" (hens), "	10 0	8 6	8 0	7 6	8 0	8 6	8 6	8 6	8 6	8 6	9 0	12 0
Geese, "	7 6	7 6	8 0	8 0	7 0	6 6	..	..	..	..	..	9 0
WELLINGTON MARKET.—Supplied by George Thomas and Co. and Laery and Co.												
Chickens,* per pair	5 0	5 0	5 0	4 6	5 0	5 0	5 0	5 0	5 6	5 9	6 0	6 0
Hens, "	4 0	4 0	4 6	4 0	4 0	4 0	4 0	4 6	4 9	5 0	5 0	5 0
Ducks, "	5 0	4 6	4 9	4 9	4 6	4 6	4 9	5 0	6 0	6 6	7 0	7 0
Turkeys (cocks), per lb.	0 9	0 9	0 8	0 8	0 7½	0 8	0 8	0 8	0 8	0 9	0 10	0 10
" (hens), "	0 6	0 6	0 5	0 5	0 4½	0 4½	0 5	0 5	0 5	0 6	0 6½	0 6
Geese, per pair	8 0	7 0	7 0	7 0	..	..	..	..	..	..	8 6	9 0
Eggs, per dozen	1 2	1 4	1 4	1 6	1 8	2 0	1 9	1 6	1 3	1 0	1 0	1 0
CHRISTCHURCH MARKET.—Supplied by C. R. Wilson.												
Chickens,* per pair	4 6	4 0	4 0	3 9	4 0	4 6	4 0	4 6	4 9	5 0	6 0	5 6
Hens, "	3 0	3 0	3 0	3 0	3 0	3 0	3 0	3 3	3 6	3 9	4 0	3 6
Ducks, "	4 6	4 6	4 3	4 0	4 0	4 0	4 6	4 9	5 0	5 6	6 0	5 6
Eggs, per dozen	1 0	1 2	1 3	1 5	1 6	1 10	1 6	1 7	1 2	1 0	0 10	0 10
DUNEDIN MARKET.—Supplied by Waters, Ritchie, and Co., A. Moritzson and Co., T. E. Shiel and Co., and New Zealand Fruit and Produce Company.												
Chickens,* per pair	5 0	4 6	4 0	4 0	3 6	4 0	4 6	4 9	4 9	4 9	5 6	6 0
Hens, "	3 3	3 0	3 0	3 0	3 0	3 0	3 0	3 0	3 0	4 0	4 0	4 0
Ducks, "	4 6	4 3	4 0	4 0	4 0	4 0	4 0	4 0	4 0	5 0	5 6	6 6
Geese, "	6 6	6 6	6 0	6 0	6 0	6 6	6 6	6 0	6 0	6 0	7 0	7 6
Turkeys (cocks), per lb.	0 9	0 8	0 7	0 7	0 7	0 7	0 7	0 8	0 8	0 9	0 10	0 10
" (hens), "	0 6	0 5	0 4	0 4	0 4	0 5	0 4	0 5	0 5	0 6	0 6	0 6
Eggs, per dozen	1 2	1 4	1 4	1 6	2 0	2 3	1 9	1 6	1 0	0 10	0 11	1 0

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* "Chickens" means roasting-fowls (roosters four to five months old),

PRESERVING EGGS.

There is a wide difference between the values of eggs in spring and winter, prices varying in the grocers' shops from about 7d. to 2s. 6d. per dozen, which shows conclusively that something should be done to enable the farmer to make a profit at the time when eggs now reach the lower quotation. In order to do that, eggs will have to be preserved, and held until a better price is obtainable. In my opinion, the farmer should not get less than 1s. per dozen for eggs. So far as the consumers are concerned, it will simply mean that they will pay a more uniform price all the year round, and that 1s. 6d. or 1s. 9d. will be the highest price that will be reached. There are many methods of preserving eggs, but the very best I know are as follows :—

10 lb. slaked lime, 1 lb. salt, 1 lb. cream of tartar, dissolved in 20 gallons of water. Stir the mixture every day for a week, when it will be ready for use. Eggs for preserving must be perfectly fresh—this is most important—and will keep much better if not fertilised. (There is no occasion to keep roosters with hens if you do not wish to breed from them.) Place the eggs in a barrel and cover them with the mixture, each day putting in more eggs and covering them till the vessel is full; then seal, and put away in as cool a place as possible.

Another excellent preservative is to boil 20 gallons of water in order to sterilise it, and when cool add 1 gallon of water-glass. The latter is known to chemists as "Soluble silicate of soda," and is procurable from any soap-works at from 2s. to 2s. 6d. per gallon. Stir thoroughly, and pour the mixture over the eggs as in the former instance. Examine eggs occasionally to make sure that the liquid has not evaporated and left some of the upper ones exposed; wash the eggs when they are removed from the fluid.

COLD-STORAGE OF EGGS.

This method of preserving eggs has been attended with great success in the United States and Australia for some years past. It is, however, a comparatively recent development in this colony, and has in some cases (owing to defects in the cold-storage provided) not been an unqualified success. Arrangements have now been made in Dunedin whereby the proper conditions will be strictly observed, and the result will no doubt prove satisfactory to all concerned.

I am quite convinced that cold-storage is the best method for keeping eggs. If they are sent through the Government depots there will be no trouble in disposing of them when the time comes, as each case will bear the Government stamp as to quality. Each year should see an increased number sent to cold-store by this channel, and, if so, each year will see an increased egg-consumption per head of our population. The prices will not fluctuate to the same extent as formerly, consequently there will be no time of the year when prohibitive prices will be asked.

The conditions under which the Department of Agriculture receives eggs for cold-storage are exactly the same as the export conditions (see page 8). Payment for the first month's storage and for the boxes is included in the grading charge of 2d. per dozen. Subsequent storage, which must be borne by the owner, amounts to 6d. per case of thirty dozen —less than one farthing per dozen—per month.

Cold-storage of Eggs in the United States.

Under date of the 15th May, 1902, a Chicago paper states: "Eggs went into the coolers last year at an average cost of 12¾c. This year, thus far, the cost has been about 15½c. For argument's sake, say, the average price for the season is 15¼c., as against 12¾c. last season. This makes the eggs cost 2½c. per dozen more than they did last year, and if there are to be 700,000 cases of eggs, with thirty dozen to the case, it means 21,000,000 dozen. This advanced cost, then, shows $525,000 more invested in eggs in Chicago alone than it would have cost to put the same eggs up last year If the average prices of the eggs in the coolers, and to be put in the Chicago coolers this year, is 15¼c., and 700,000 cases go in, it means a total valuation of $3,202,000. Figures sometimes are uninteresting, but these will give the reader something of an idea as to what extent storage of eggs in Chicago involves the investment of capital. If the total storage of eggs for the whole United States this year reaches 5,000,000 cases, every dozen will cost out of the coolers an average of 17c. Then the total money tied up in eggs will be $25,500,000 (about £5,312,500). Quite a tidy sum."

DURATION OF THE MALE INFLUENCE.

This is a point on which questions are frequently asked me. There is no definite rule as to the exact time it takes for the male bird's influence to affect the eggs laid, but it may be fairly accepted that eggs can be pretty safely depended upon to be fertile after a vigorous rooster has been with the hens seven days, and the eggs will continue to be fertile for the same period after his removal, always provided, of course, that the number of hens is not excessive.

SOURCES OF GREAT BRITAIN'S FOREIGN SUPPLY OF POULTRY PRODUCTS.

The following tables, for which we are indebted to the Statistical Department of the Home Board of Agriculture and Fisheries, gives the sources of Great Britain's foreign supply in 1903 :—

Imports of Eggs into Great Britain during 1903.

	Number (in Thousands).		Number (in Thousands).
Russia (North)	816,333	Gibraltar	156
Sweden	5,561	Austria-Hungary	32
Norway	3	Turkey (Europe)	29
Denmark	462,187	Turkey (Asia)	196
Germany	358,530	Egypt	81,441
Holland	14,603	Morocco	56,395
Belgium	274,951	Canada (Atlantic ports)	66,850
Channel Islands	1	United States "	19,369
France	192,233	Cyprus	10
Portugal	12,140	Uruguay	57
Spain	8,790		
Canary Islands	1	Total	2,369,868,000

It must be observed, in connection with the above, that the returns given as to Belgium, Germany, and Italy are misleading, because the last country through which the shipments pass is credited with them, and not the country of origin. Thus, as Germany sends practically none and Belgium very few of her own eggs, we must credit the amounts of these two countries to Italy, Russia, and Austria-Hungary.

The most striking development of late years has been in connection with Russia. In 1890 the imports from that country were so small that no separate entry was made in the trade and navigation returns, but by 1903 they had grown to £1,866,421 for eggs and £324,087 for poultry and game.

The signs indicate a further increase; but, happily for British producers, the quality is of low grade.

MARKETS.

South African Markets.

The quantity of poultry required for South Africa during 1904 was greater than in any previous year, and the falling-off in the numbers prepared for export at the departmental depots was due solely to our exporters being unable to obtain in sufficient numbers suitable birds at remunerative prices, the rates ruling locally being far too high. In consequence, some of the exporters were obliged to buy and ship quantities of ungraded poultry in order to complete their contracts. The shipping of ungraded poultry is to be deplored, as it will tend to injure the trade of this colony, as it has already done in the case of Australia. It, however, seems clear that there is in South Africa a good market for chickens and fowls that are below the weight hitherto adopted by the Department of Agriculture as the minimum for birds accepted by it for export. Therefore, in order that exporters of these small birds may not be debarred from the advantages of sending them through the Government depots and in order to avoid unevenness of grading, it has been decided to establish four distinct grades for fowls and chickens and two for ducklings and ducks for the South African markets. These grades will be known as the A, B, C, and D grades.

The A grade will consist of birds scaling not less than 2½ lb. but under 3 lb., live weight.

The B grade will consist of birds weighing 3 lb. but under 3½ lb., live weight.

The C grade will consist of birds weighing not less than 3½ lb. but under 4 lb., live weight.

The D grade will consist of birds weighing 4 lb. and over, live weight.

Ducks and ducklings:—

C grade, 3½ lb. but under 4 lb.
D grade, 4 lb. and over.

It must be distinctly understood that no bird will be accepted for export in any of these classes unless it is in good condition and in no way likely to give New Zealand poultry a bad name on the South African or other markets.

At present practically the whole of our poultry available for export is shipped to South Africa. Hitherto it has found a ready sale there, our birds and methods of preparing them for export having been generally considered superior to those of other countries. Recently, however, America and Russia have been giving special attention to the quality and preparation of poultry for the South African markets, and the result has been a considerable increase in the demand for their goods, particularly for Russian, owing possibly to the lower price and greater care in packing. So noticeable has the improvement been that South African buyers now stipulate for Russian or American methods; and, in order that New Zealand may keep pace with every development, sample cases showing the methods adopted by America and Russia are at my request being forwarded here from South Africa by our Trades Commissioner there, and the methods followed will be carefully studied and adopted as far as appears desirable.*

According to qualified judges the South African market will be a permanent one for table-poultry and eggs, and in order that New Zealand may establish herself firmly there it is essential that the quality and preparation of our poultry shall be according to buyers' requirements. The demand for poultry and eggs in South Africa for 1903 was nearly double as much as it was in 1902.

It may be mentioned that some buyers in South Africa have an objection to brown-shelled eggs, the idea being that the dark colour is due to the eggs having been kept for some time in the smoky atmosphere of Native huts.

THE HOME MARKET.

Should the South African demand fail at any time, the difference of the seasons in New Zealand and England will always enable us to find a good market in London for poultry at times of the year when we can most conveniently produce it. It may be noted that brown-shelled eggs generally bring the highest prices on the London market.

OVERSTOCKING THE MARKETS.

Despite the increase in the numbers of those engaged in poultry-raising, the supply of first-class birds for both local and export markets still falls short of requirements. It should be the aim of every poultry-breeder to produce and market birds of first quality only. The markets can easily be overstocked with birds of inferior quality, which are neither profitable to the producer nor satisfactory to the consumer. Poultry and eggs of the best quality will always be in demand.

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* Since the foregoing paragraph was written I have received from South Africa, through the Trades Commissioner, two cases of poultry, one of Russian fowls and one of American ducks. They were examined, and the methods of killing, packing, &c., noted. The examination showed that in every particular, with the possible exception of killing, New Zealand birds and methods of preparation are unquestionably superior. A detailed criticism will appear in my forthcoming annual report.

PRICES OF FOWLS IN CENTRAL AND LEADENHALL MARKETS, LONDON, FOR TWELVE MONTHS.

—	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
	s. d. s. d.	s. d. s. d.	s. d. s. d.	s. d. s. d.	s. d. s. d.	s. d. s. d.	s. d. s. d.	s. d. s. d.	s. d. s. d.	s. d. s. d.	s. d. s. d.	s. d. s. d.
Best Sussex fatted chickens .. each	3 0–5 0	3 0–5 0	3 6–5 0	3 6–5 0	3 3–5 0	3 0–5 0	2 9–4 6	2 6–4 0	2 9–4 6	3 0–4 0	2 6–4 0	2 9–5 0
Extra large, or capons .. each	5 6–8 0	5 0–8 0	5 6–7 6	5 6–8 0	5 6–8 0	5 0–7 0	4 6–6 6	4 4–5 6	5 0–6 0	4 6–6 0	4 0–6 0	5 0–8 0
Boston and Cambridge chickens each	2 0–3 6	2 0–3 6	2 6–4 0	2 6–4 6	2 6–4 0	2 6–3 6	2 0–3 0	2 6–3 0	2 0–3 3	2 0–3 0	2 0–3 0	2 3–4 6
Essex chickens .. .. each	2 0–3 6	2 0–3 6	2 6–4 0	2 6–4 6	2 6–4 0	2 6–3 3	1 9–2 9	1 6–2 6	1 6–3 0	1 9–3 0	1 6–2 6	1 9–3 9
Irish chickens .. .. each	1 6–2 6	1 6–2 3	1 9–2 6	2 0–2 9	2 3–3 3	2 0–2 9	1 3–1 9	1 3–1 9	1 6–2 0	1 6–2 0	1 9–2 0	2 0–2 6
Hens two years old .. .. each	2 0–2 6	2 0–2 6	2 6–3 0	2 0–3 6	2 0–3 0	2 0–2 6	1 6–2 6	1 6–2 0	1 6–2 6	1 6–2 3	1 6–2 6	1 6–2 6
Russian chickens .. .. each	1 1–1 8	1 1–1 8	1 2–1 8	1 8–2 0	1 8–2 0	1 8–2 0	1 6–2 0	*1 6–1 8	..	..	..	..
Canadian chickens .. .. each	1 6–2 9	1 6–2 9	1 6–2 9	1 6–3 6	1 6–3 6	1 6–3 9	1 6–2 9	†1 6–2 9	..	..	..	..
Australian chickens .. .. each	2 0–3 0	2 0–3 0	2 3–3 6	2 3–3 6	2 9–3 9	2 0–2 6	‡2 0–2 6	..	..	..	..	..
Average prices of English ducklings in Leadenhall markets	3 0–5 0	3 3–5 6	4 6–9 0	3 6–6 0	3 0–4 0	2 6–3 6	2 0–3 0	2 0–3 0	2 0–3 0	3 0–4 0	3 0–4 0	3 0–4 0

* Little or no sale after August. † No sale after August. ‡ Very little sale till New Year.

Note.—All the above-quoted prices are per bird, *not* per pair. It will be noted that maximum and minimum prices are quoted.

PURE-BRED POULTRY AND EGGS FROM THE DEPARTMENT OF AGRICULTURE.

Pure-bred poultry and eggs for breeding purposes are kept for sale at the Government poultry-stations at Ruakura (near Auckland), Momahaki (near Waverley), Burnham (near Christchurch), and Milton (near Dunedin).

Applications should be made, in writing or verbally, to the manager at the poultry-station. The breed required should always be stated, and in the case of Leghorns, Orpingtons, or Wyandottes *the variety also*. This will save correspondence and consequent delay.

The Department takes every care in the despatch of poultry and eggs, but can accept no responsibility for safe delivery.

All orders must be accompanied by the proper remittance.

Orders are executed in rotation, and as little delay as possible is occasioned. An advice-note is always posted as soon as the order is filled. This is mentioned because some applicants seem to be under the impression that as soon as they receive a receipt for the remittance the eggs or birds should be delivered.

The hatching season, during which eggs will be obtainable from the Department, is from July to November. Young stock are for sale from the end of March in each year.

Price of Eggs for Setting.

Duck-eggs (Aylesbury, Pekin, or Indian Runner), 7s. 6d. per dozen, including packing and postage.

Hen-eggs (of all the breeds illustrated herein), 6s. 6d. per dozen, including packing and postage.

Price of Poultry for Breeding.

The price of young stock of all the breeds illustrated is 5s., 7s. 6d., or 10s. per bird, according to selection. Freight is payable by the purchaser, and coops are 2s. extra. When ordering state the price you wish to pay, and remit it with the price of the coop, and selection will be made accordingly.

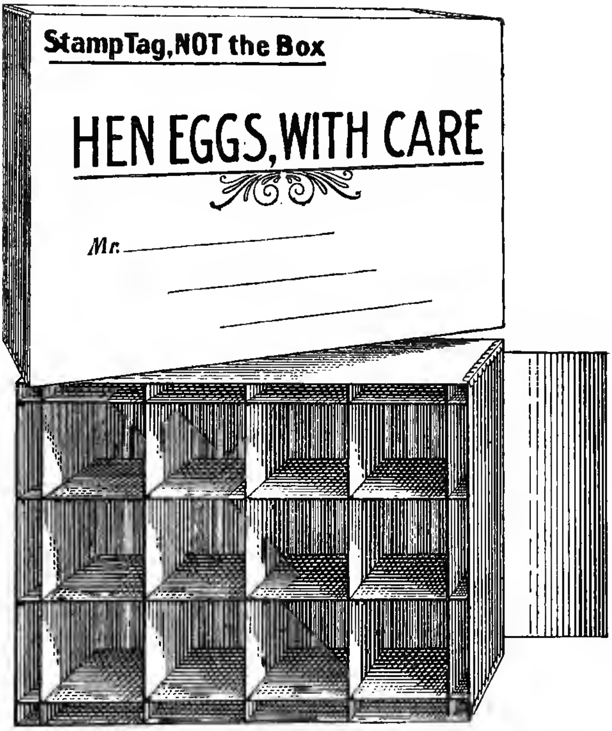
Replacing Infertile Eggs.

Owing to numerous cases of imposition in connection with the above, it has been decided to strictly enforce the following rules:—

Claims must be made in writing, and forwarded, accompanied by the alleged infertile eggs, to the manager of the poultry-station whence the eggs were forwarded.

All returned eggs which, upon examination at the poultry-station, are found to be infertile will be replaced on receipt of payment for postage and box, amounting to 1s. 6d. per dozen or part thereof for hen-eggs and 1s. 9d. for duck-eggs.

Egg-box.

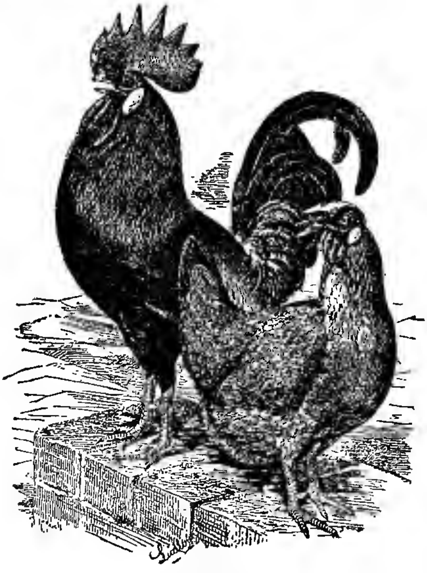


The egg-box shown above is made of leather cardboard, and is the style adopted by the Department of Agriculture for forwarding eggs for sitting purposes through the post.

BREEDS KEPT BY THE DEPARTMENT OF AGRICULTURE.

Andalusians.

Splendid layers of good-sized white-shelled eggs, and non-sitters. If killed when about four months old, fairly good for the table. The flesh is white. They do best with a large range, and are moderately hardy. These birds are hard to breed to true type, as they frequently produce pure black, white and black, and white, no matter how pure the stock may be.



Leghorns.

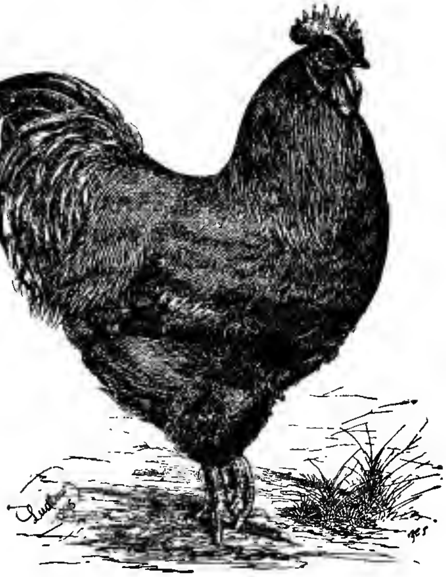
Splendid layers of a medium-sized white-shelled egg, and deservedly popular. They are hardy, and can be kept, if necessary, in a small space. Both the brown and the white breeds are in stock. The white variety lay the largest egg. When ordering birds or eggs please state which colour you desire.

Minorcas.

Good layers of large white-shelled eggs; are fairly hardy. If killed when about four months old, fair table-birds.

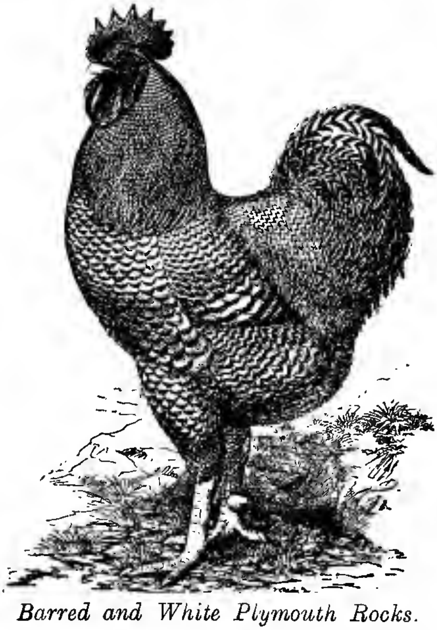
Houdans.

First-class all-round fowls. Splendid table-birds. Good layers of white-shelled eggs. Thrive well even in a small space. Their only drawback is having a crest, thereby becoming an easy prey to hawks. Suitable for export.



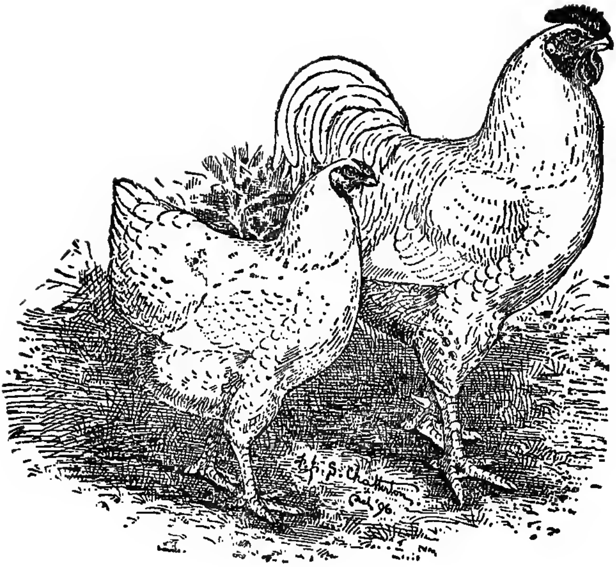
Orpingtons.

Are very popular owing to their good qualities, both for table purposes and as layers. This is one of the latest “manufactured breeds. The blacks are more favoured than the buffs, owing, no doubt, to the difficulty of producing the latter anything like up to the standard colour for show purposes Both the buff and single-combed black breeds are kept. When ordering birds or eggs please state the variety desired.



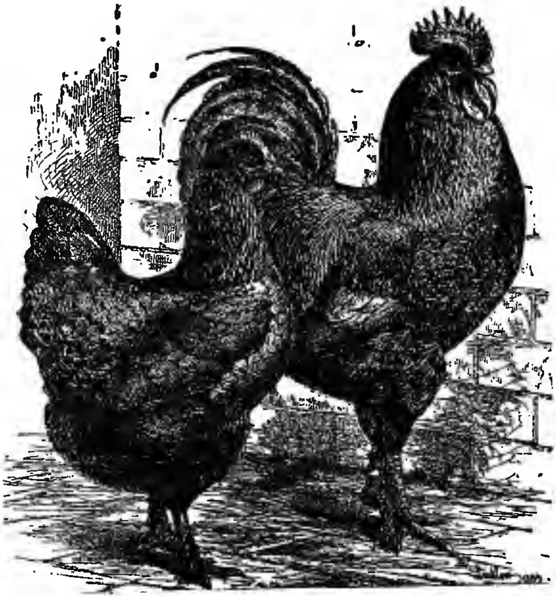
Barred and White Plymouth Rocks.

A good all-round breed, one of the hardiest procurable. They lay large brown-tinted eggs. Suitable for export. When ordering birds or eggs please mention the variety required.


H. S. Chatterton '96.

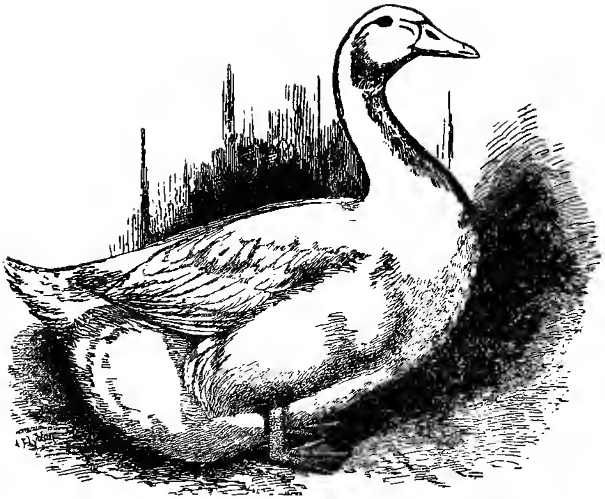
Wyandottes.

Excellent general-purpose fowls, and their splendid qualities are fast bringing them to the front. They are meaty table-birds, with the flesh in the right place. Lay brown-tinted eggs, and do well even in a confined space. The golden, silver, and white varieties are in stock. Suitable for export. When ordering birds or eggs please state the variety desired.



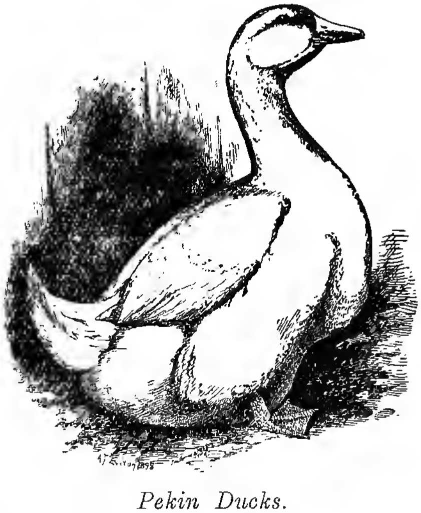
Langshans.

These were once a very popular breed, and have many good qualities to recommend them. Lay large brown-shelled eggs. As table-birds they are hard to beat; their flesh is beautifully white and juicy. Good winter layers.



Aylesbury Ducks.

Are the most sought after in the London markets. The advantage of raising ducks is that they can be marketed when from ten to twelve weeks old.



Pekin Ducks.

Very hardy. Good layers and table-birds. In America they are raised in thousands.

One of the breeding-pens of Pekin ducks at the Experimental Farm Momahaki.

Indian Runner Ducks.

These are also stocked. As layers they are more prolific than any other breed of ducks.

Turkeys.

The Department of Agriculture has imported some American bronze-wing turkeys, and will be able to supply a few orders for young birds (but not eggs) each season.

COLOUR OF YOUNG CHICKENS.

The beginner at poultry-keeping who may have purchased sittings of eggs of various breeds of poultry is often ignorant of the colour they should be when hatched. He considers, for instance, that chickens from black-plumaged fowls should be black when hatched. Such is not the case; they come black and white, but the white will disappear in a few weeks. This is mentioned owing to many purchasers complaining that the chicks must be from crossbred stock. It may be mentioned that, owing to efforts to supply the demand for dark-coloured Plymouth Rocks, at times some pure-black chicks of this breed are produced; in almost every instance they are pullets. It does not, however, follow that the eggs were from inferior parents. Silver Wyandottes often produce permanently pure-white chicks. Andalusians are the most unsatisfactory to breed for true colour, as they often come permanently black, white, or black and white, as before mentioned.

STARTING POULTRY-FARMING.

Like every other commercial undertaking, to make a success of a poultry-raising business requires capital; without money all the ability in the world cannot succeed. There is land to be obtained, houses and yards to be built, and stock and eggs to be bought; and provision must be made for feeding the birds and maintaining the keeper till returns can be counted upon. In choosing your site, remember that dry land is the best for poultry, and that it is well not to keep more than a hundred head per acre. Invest your capital by easy stages, never putting in money on which interest must be provided.

Do not rush into the business and buy up stock indiscriminately to start with. It must be borne in mind that there are good- and bad-laying strains, and that in too many instances chickens are hatched from inbred, sickly, and deformed stock. Start in a small way, and raise stock from a few well-chosen birds. Buy these from the Department of Agriculture, or from some other reliable breeder who only breeds from carefully selected stock. The majority who discard this advice will certainly join the ranks of those that state poultry will not pay.

Do not attempt to keep half a dozen breeds of fowls, as each breed requires a separate run; and every additional subdivision adds considerably to the expense and labour.

Too many think that there is nothing to learn about poultry, excepting in the case of those who keep them for show purposes, and all that need be done is to buy a few hens and a rooster, and feed the birds year in and year out on wheat, and go round with a basket and gather up eggs.

To be successful in poultry-raising, attention must be paid to all the little details that are connected with poultry-breeding. Cleanliness should be the first consideration; always make time for everything that has to be done. Remember the old adage, "Never put off till to-morrow what should be done to-day." In fact, a lazy or careless man or woman should not keep poultry, as the business requires backing up with push and energy.

Any one wishing to obtain the necessary knowledge to enable him to start poultry-farming successfully could not do better than spend some time as a student at one of the departmental poultry-stations.

The following particulars are published for the information of intending students:—

CONDITIONS UNDER WHICH STUDENTS ARE RECEIVED AT THE GOVERNMENT POULTRY-STATIONS.

The poultry-stations are at Ruakura, near Auckland; Momahaki, near Waverley; Burnham, near Christchurch; and Milton, near Dunedin.

A limited number of students are received and instructed under the following conditions:—

(1.) They must pay their own travelling-expenses.

(2.) At Momahaki board and sleeping-accommodation are available at the Government Experimental Farm, at about 12s. per week; students must, however, supply their own blankets. At Ruakura, Burnham, and Milton no Government accommodation is available, but board and lodging can be obtained privately within a reasonable distance.

(3.) Students are expected to stay at least six weeks at the poultry-station.

(4.) They receive no wages, but must do such work in connection with poultry as the manager of the station may require of them.

GOVERNMENT POULTRY EXPERTS.

It may be mentioned that Mr. F. Brown, who for years past has been connected with the practical side of poultry-keeping, has been appointed Assistant Poultry Expert in the service of the Department of Agriculture.

Poultry-breeders requiring any advice on poultry matters should arrange for a visit from one of the experts, by making application to "The Chief Poultry Expert, Department of Agriculture, Wellington."

Intending poultry-breeders should avail themselves of the Experts' services when selecting stock and arranging the best situations, plans, &c., for their poultry houses and yards, and will thus avoid many of the mistakes frequently made by beginners.

CHEAP LANDS AND POULTRY.

If a piece of poor land is idle and is unsuitable for other stock, it will pay to put poultry on it. If the houses are built sufficiently far apart and the hens have unlimited range, they will need very little attention in the summer months, the feed given depending on the vegetable growth upon the land; under favourable circumstances the birds will find nearly all the food they need. If the growth is scanty, give a small quantity of grain before the birds go to roost. If the soil is heavy and damp the following breeds will be the best to keep: viz., Langshans, Plymouth Rocks, Orpingtons, and Wyandottes. On light dry soils, Minorcas, Leghorns, Andalusians, and Houdans. Sandy or gravelly soil is best adapted for all kinds of poultry. Pure sand, however, is undesirable, as it does not give sufficient natural food. There is one thing that must be borne in mind, no matter what the nature of the soil may be—the fowls must have shade and shelter. Farmers must realise the fact that poultry should not be a side-business on the farm, as the hens give returns all the year round. The farmer who despises the hens is making a big mistake. There is more money in fowls, per pound expended, than in the case of other stock.

FOWLS OR EGGS.

Which pays best, fowls for the table or eggs?—is a frequent inquiry. I do not think that either alone will pay so well as both combined. To keep hens of the non-sitting breeds for eggs alone is to lose a profit that may be made on chickens. Some breeds will bring off a brood and lay nearly as many eggs in a year as those that do not sit. Poultry and eggs are inseparable. It is therefore advisable to pay more attention to the breeding of such birds as Orpingtons, Langshans, Wyandottes, Plymouth Rocks, and Houdans.

PURE-BRED FOWLS OR MONGRELS.

It is gratifying to find that at last the farmers are waking up to the fact that it does not cost any more to feed a really good well-grown table-bird than it does the barndoor mongrel. If the producers would do as I advocate, insist upon being paid at per pound weight for poultry for the table, it would be to their advantage. It certainly would be a much more satisfactory arrangement with the consumer also. As so little capital is required to be sunk in birds to breed from it is poor economy to keep any but the best.

CROSSES.

For those who are partial to crosses the following are considered the best: The best crosses for table purposes are Indian Game-Dorking, Indian Game-Langshan, Indian Game-Houdan, and Indian Game-Orpington. Old English Game can be used with great advantage for producing table poultry. The best crosses for laying and general purposes are Minorca-Langshan, Leghorn-Plymouth Rocks, Leghorn-Houdan, Leghorn-Langshan, Houdan-Wyandotte, Leghorn-Orpington, and Leghorn-Wyandotte.

In all crosses use a cock of the breed first named.

BREEDING CROSSBREDS.

It is necessary to use a cock of a different breed each year for at least three years in succession when crossing fowls, or you will quickly mongrelise them. Example: First year, Plymouth Rock; second year, Orpington; third year, Wyandotte; then the Plymouth Rock can be used again, and so on.

Never breed from a crossbred cock.

BEST LAYERS.

The best laying-hens are the most active—the ones that will do the most scratching in your garden if given an opportunity! You will find them first off the perch in the morning, and last on at night. They have generally small heads and bright eyes; select these to breed from. Those that have large heads and overhanging eyebrows will be found loitering about waiting to be fed; relegate such to the table without delay. Long beaks and long narrow heads denote a poor constitution.

GET RID OF OLD STOCK AND COCKERELS.

The South African markets will absorb all the old hens that can be produced, and it is more profitable to sell them at the end of the second period of laying for 3s. or 4s. per pair than to keep them another season, during which the eggs obtained will seldom pay for the food consumed.

Do not keep an old hen because she has some peculiarity about her; there should be no sentiment about poultry-keeping when it is a question of making a living out of it.

See the instructions on page 74, under the heading of "Fattening Fowls," and act accordingly.

A great mistake is also made in keeping cockerels longer than five months, as if properly fed they are then at their best; and to keep them till they are ten or twelve months old spells loss.

Remember, it costs 1d. per week per head to feed fowls, and the only way to make a profit out of the birds sold for table use is to market them at the age advised.

Send the birds to the consumers in good condition, and there will be no lack of demand. The public will not object to pay a good price for a good article, but they resent paying a high price for a scrag.

KEEPING A RECORD.

There are many people under the impression that the eggs their hens lay cost about 3d. each. Keep a record on a sheet as shown herewith, and see how quickly the opinion will be changed for a more favourable one. The record will also show the profit there is in the business, averaging the eggs at 1s. per dozen all the year round.

Number of Hens : *Breed :* *Month :*

Date.	Number of Eggs.	Amount and Kind of Food given.			Remarks.
		Morning.	Noon.	Evening.	
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
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31					

WHY EGGS FAIL TO HATCH.

Too many hens with a cock bird will result in a large number of infertile eggs or weakly chickens, and the same result may follow if the hens are too few. A great deal depends on the breed and vigour of the male bird. The best results will generally be obtained by running eight hens with one rooster of the utility breeds such as Orpingtons, Wyandottes, Plymouth Rocks, &c., and ten hens with one rooster of the lighter breed—viz., Minorcas, Leghorns, &c.

Another cause of infertile eggs is owing to the cock bird not getting sufficient food. Very frequently he will wait until the hens are all fed before helping himself, and if there is not enough he will lose condition. In that case it will be necessary to feed the rooster away from the hens.

Eggs from abnormally fat hens seldom hatch; the chickens die in the shell, or those that do hatch seldom live long. Eggs from a lazy, sleepy hen hatch late. Therefore breed from your most active hens; watch carefully that you do not overfeed the birds that you breed from. Dorkings, Brahmas, and Cochins—in fact, all the heavy breeds—want very careful feeding, as they put on fat quickly. Examine the condition of the birds when they are on the perch at night.

Persons who obtain eggs for setting and get poor results almost invariably blame the eggs. This is not by any means fair. Not a few hens are unsuitable for hatching; with some the temperature is too low, whilst with others it is too high; there are others, again, that sit too close, not giving the egg sufficient time to cool down.

Again, eggs are often rendered useless for hatching purposes by rough usage after they have been handed over by the postal officers to the purchaser's messenger.

Lastly, eggs often fail to hatch because some of the directions given on page 39, under the heading of "Management of Sitting-hens," are neglected.

FERTILITY OF EGGS.

"A few words as to infertile eggs will not be out of place. By the term 'infertile' is meant an egg that has never been impregnated by the male germ, and, consequently, one that cannot possibly hatch. The germ must be communicated ere the egg is formed, and must be impregnated, and the egg is meant to be its protecting envelope. The effect of heat upon an egg is to dry up the contents and reduce them to a smaller compass. An infertile egg does not go rotten—a fact not generally known. Without death there can be no decay, and there cannot be death unless there has been life. Absence of a fertilising germ means that the contents of the egg are inert or lifeless, and will not become rotten. On the other hand, when there has been life, and this life has died, all the elements of decay are within the shell, and that which would have been its strength becomes its weakness. The only exception is when the egg has been produced by a diseased hen the dead embryo—or, if the chick has been more or less formed, the dead chick—begins to decay, and soon the whole contents are a mass of corruption. This fact needs explanation, as many persons have erroneous ideas thereon. We have known people who have purchased eggs say (in a tone which indicated that they thought they had been cheated) that the eggs were actually rotten, whereas the fact of their being rotten proves that they were, at all events, fertile, the probability being that the failure to hatch was due to want of proper care on the purchaser's part."

PACKING EGGS FOR HATCHING

Never nail the lid on to the box; use screws; hammering will destroy the germ.

Never put damp hay, straw, or sawdust against eggs. Never pack them, especially for a long journey, so that air is entirely excluded.

Never turn the large end down in packing, as the weight of the yolk is apt to break the air-bubble by being jarred in transit. If you receive eggs for hatching from a distance, give them twenty-four hours' rest before putting them underneath the sitting-hen or in the incubator. These are little precautions worth remembering.

EGG-EATERS.

Should you have any egg-eaters among your flock, carry with you a china egg, and every time you go near the birds throw the dummy egg to the ground. The culprits will rush at and try and break the egg; after making several attempts, and failing, they will generally give up the practice.

The editor of an American poultry journal states that the best remedy for egg-eating is to give a free supply of eggs or egg-shells for a few days. This remedy, he says, never fails. Obtain a basket of fresh egg-shells from your baker and throw them to the fowls whole; give them all they can eat and keep a supply before them for some days, and the trouble will cease. There is a pile of testimony, he says, to the success of this cure.

As, however, prevention is better than cure, have always a plentiful supply of lime for your hens. It is the want of lime to form the egg-shell that induces the pernicious habit, as the hens lay soft-shelled eggs, which get easily broken. Once the hens taste an egg, they soon learn to break and eat a hard-shelled one. Scatter grain among hay, straw, or leaves, pine-needles, &c.; compel the birds to exercise, and provide plenty of nest-boxes, darkened, and half-filled with straw-chaff. It is a good plan to have a few nest-eggs lying about the runs also. All these prevent the bad habit.

MANAGEMENT OF SITTING-HENS.

The greatest attention should be paid to sitting-hens. In the first place, half-fill the nest-box the hen is to sit in with moist earth; beat it down pretty firmly with your hands, and make the nest so that the eggs will have a tendency to roll to the centre, or, in other words, saucer-shaped; then sprinkle a little lime over the earth, and a thin layer of hay, straw, or pine-needles.

Sprinkle the hen with carbolic powder or flour of sulphur, and see that the powder reaches the skin: this is to destroy the vermin that the bird is almost sure to be covered with.

In the evening place her on a few dummy eggs until satisfied she will sit steadily: she is more likely to do so if the nest is slightly darkened.

Sitting-hens should be kept away from the general flock, and should have ample hard corn, meat, bread, and hemp-seed put in a convenient place, so that they can obtain what they want on leaving the nest. Hard, sharp grit must be supplied, and plenty of fresh water should be kept in the shade ready for their use. Have a dust-bath available in a dry place where the sun can get at it.

The eggs you are going to put under the sitting-hen or in an incubator, if they have come a distance, should have twenty-four hours' rest. The number of eggs to put under a hen depends upon her size, but it is better to put too few than too many; twelve eggs are enough for most hens.

Mark the large end of the eggs with the date they are placed under the hen; if marked in any other place it would interfere with the testing of the eggs.

When a hen is set in a dry place, the skin of the egg just underneath the shell becomes so dry and tough that the chick cannot cut through it, and consequently dies in the shell. Should a hen insist on sitting in a dry place, it will be necessary to moisten the eggs slightly with warm water; the best plan is to dip them and let them remain in the water for about two or three seconds. This should be done once a day during the last week of incubation. Care must be taken when lifting the hen off the nest each morning that there are no eggs under her wings. Should an egg get broken, remove it immediately; and if any portion of the broken egg is on the others, wash it off with warm water at once, as when it dries it stops the pores of the shell and prevents the air passing to the chick.

If two or three hens are set on the same day, and a number of the eggs should be infertile, one hen may be able to take all the eggs, and the others cooped for a few days, when they will soon commence to lay again, or else be used to sit on a fresh lot of eggs.

HOUSES AND ACCOMMODATION.

To be successful in poultry-keeping it is absolutely necessary to have suitable premises for the fowls to live in. They should not be permitted to roost in trees, as when they become soaked by rain part of their animal heat is used in evaporating the water, and egg-production is checked. In order to save food, shelter should be given from cold winds and rains.

It is not necessary that the buildings for this purpose should be elaborate in construction, but they should be just large enough to accommodate the number of birds you wish to put in them, allowing 15 to 20 cubic feet of air-space for each bird. It is a fatal mistake to have fowls overcrowded; therefore scatter them as much as possible into small flocks.

As a general principle, a house 7 ft. square will accommodate twenty-five fowls.

Place in the fowlhouse a large window facing the north-east, in order to obtain as much of the sun's rays into the buildings as possible. This is a provision that is too frequently overlooked.

If galvanised iron is used for roofing the building it should have boarding under it, owing to the iron being a rapid conductor of heat and cold.

The building must be well ventilated, but there must be no draught. The importance of this is very generally ignored, so that it is quite the exception to find poultry-houses constructed with any attempt at ventilation. If the house is visited two or three hours after the birds have gone to roost it can be readily ascertained whether it is sufficiently ventilated or not. The atmosphere should strike rather warmer than that of the outer air, but there should be an absence of closeness or smell. To enable the proper medium to be arrived at, a small hole, about 12 in. by 6 in., should be made at the upper part of the house, and covered with perforated zinc or small-mesh wire netting, and arranged so that it may be entirely or partially closed; a board to slide in grooves, similar to those generally made to cover the hole by which the fowls enter the house, will be as suitable as anything.

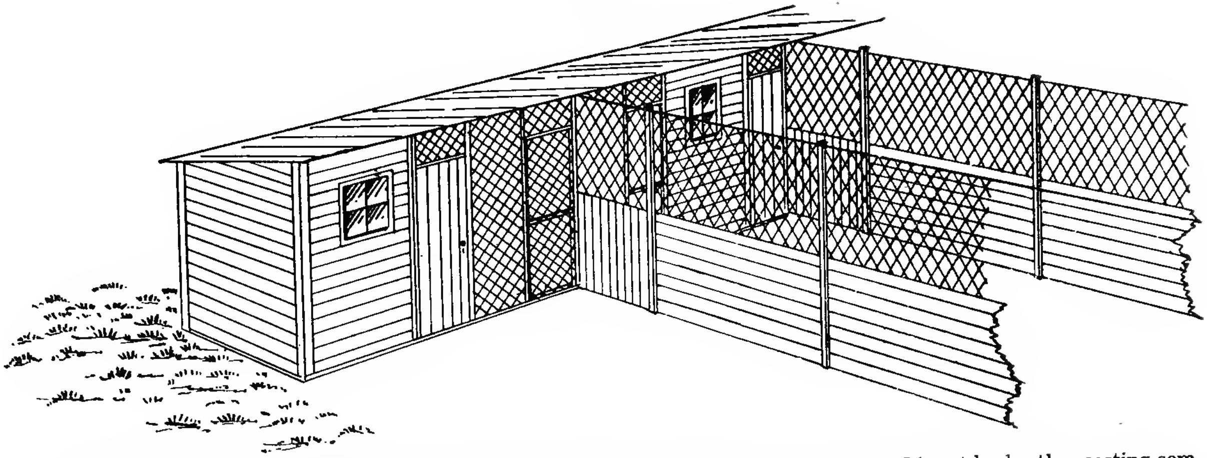
The buildings shown in this pamphlet are those in use at the Government poultry-stations, and are most suitable in every way as breeding-pens. The main flocks are put out about the farm in movable houses, 7 ft. by 5 ft., an arrangement I strongly recommend to farmers, as the fowls by this system require very little feeding, so long as the houses are moved on to fresh ground once a week.

The movable house referred to is illustrated on page 48.

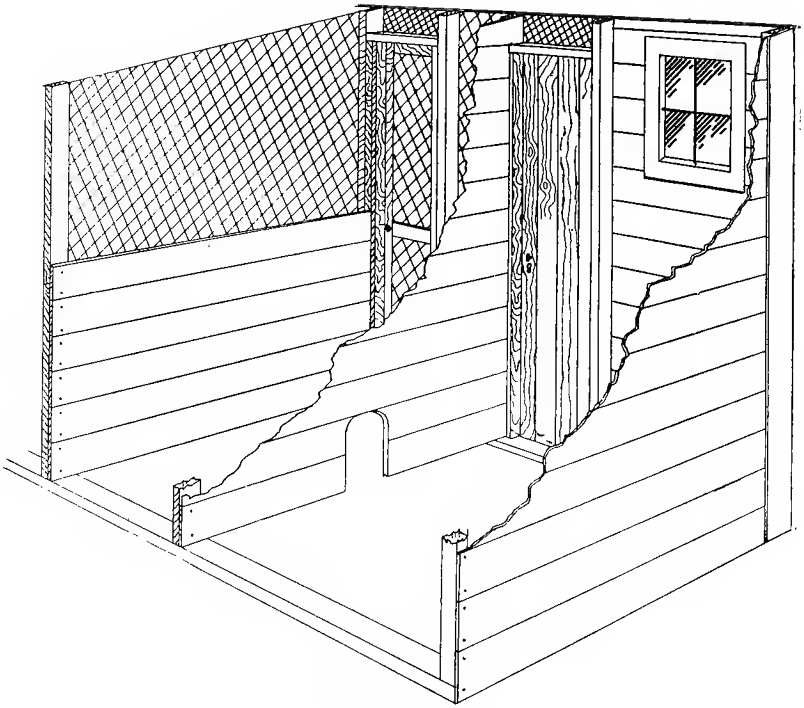
The front of the breeding-pens should face the rising sun.

A boarded, concrete, or asphalt floor should not be used; earth only is required, and should be built up inside the fowlhouse 6 in. higher than the surrounding ground, in order that it may be kept dry.

No. 1.

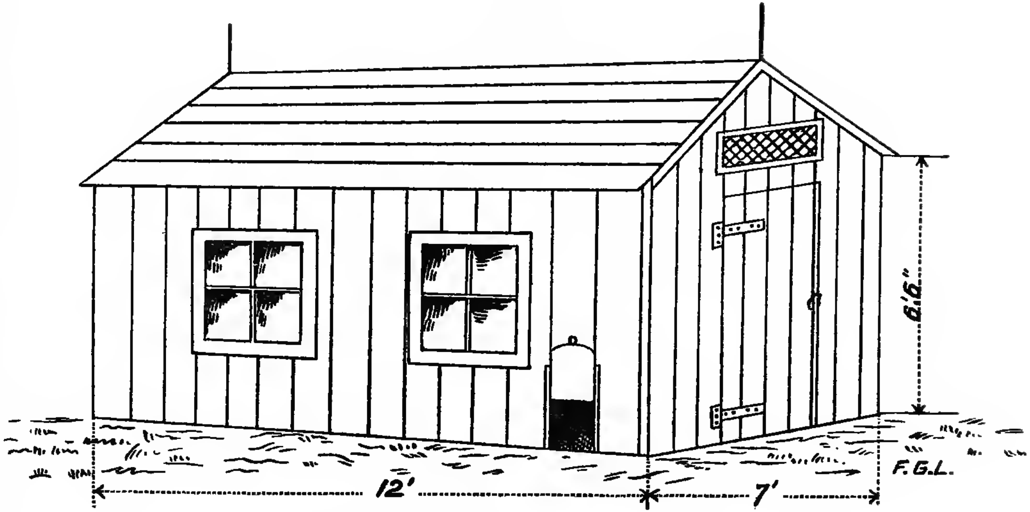


Can be made any size to suit requirements. That shown above is 6 ft. 6 in. in front, 5 ft. 6 in. at back; the roosting-compartment is 6 ft. by 6 ft.; scratching-shed, 6 ft. by 4 ft. This size is for eight hens and one rooster. The runs are 10 ft. wide by 50 ft. Larger runs would be an advantage.

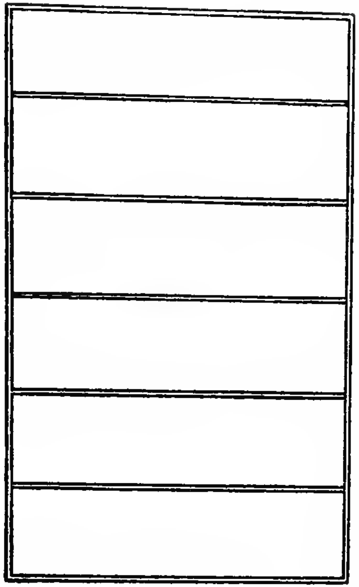


Interior No. 1.

FOWLHOUSE.

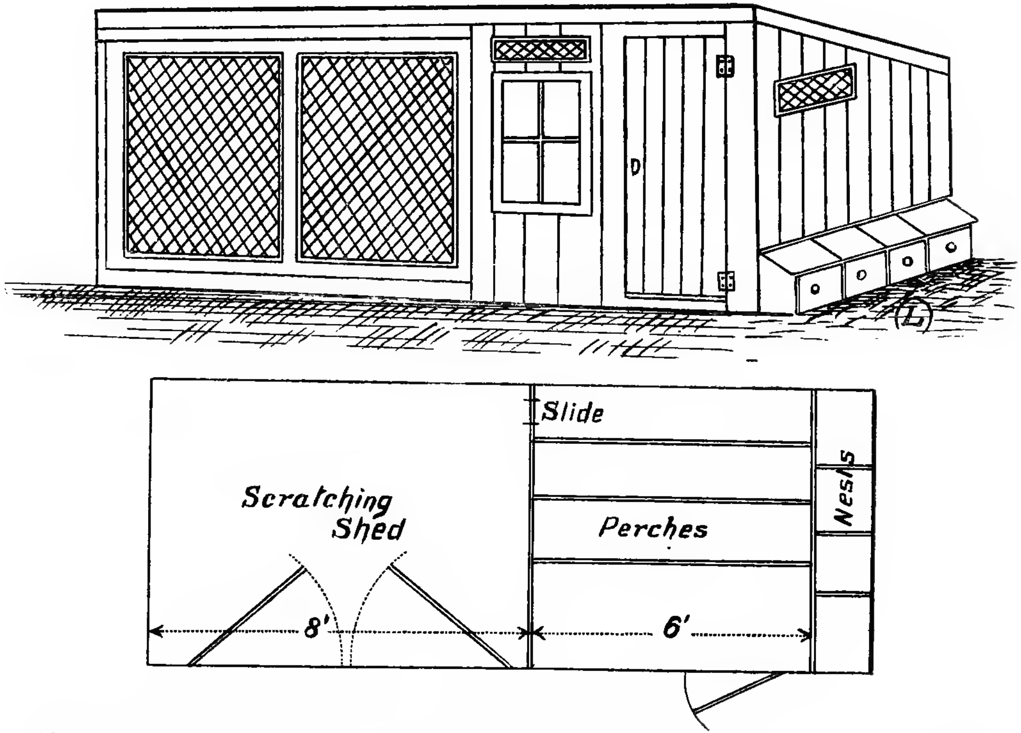


Fowlhouse



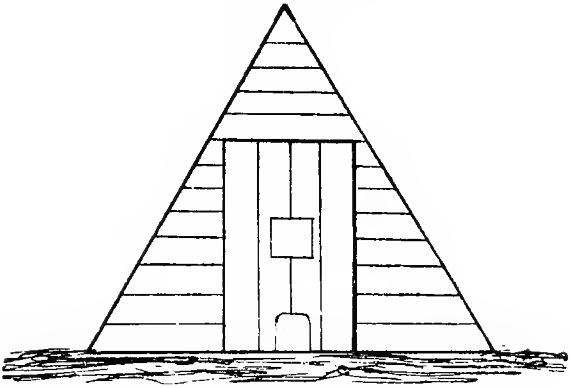
Perches

COMBINED FOWLHOUSE AND SCRATCHING-SHED.

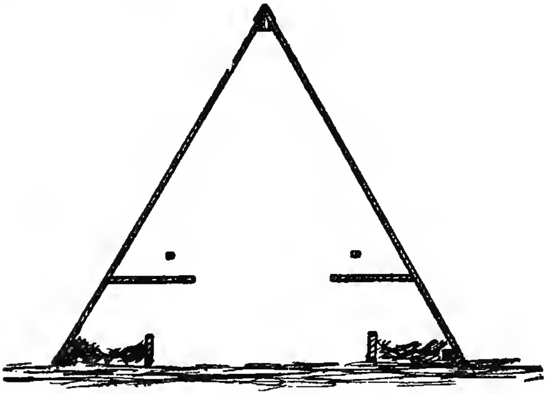


The above represents a fowlhouse and scratching-shed designed by myself. At the end are shown nest-boxes so arranged that eggs may be obtained without entering the building. The dimensions are as follows: Fowlhouse, 6 ft. by 6 ft.; scratching-shed, 8 ft. by 6 ft. The front elevation is 7 ft., and the rear 6 ft.

DESIGN FOR FOWLHOUSE.

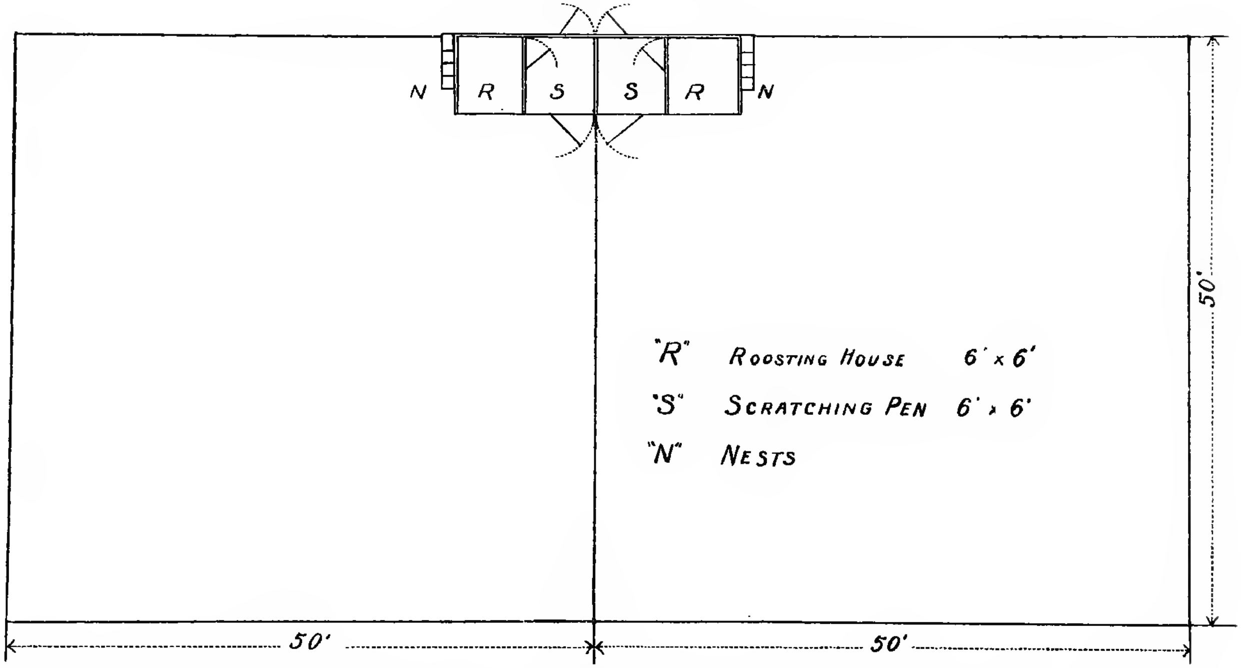


DESIGN FOR A CHEAPLY CONSTRUCTED FOWLHOUSE.



Front elevation, 7 ft.; width of face, 7 ft.

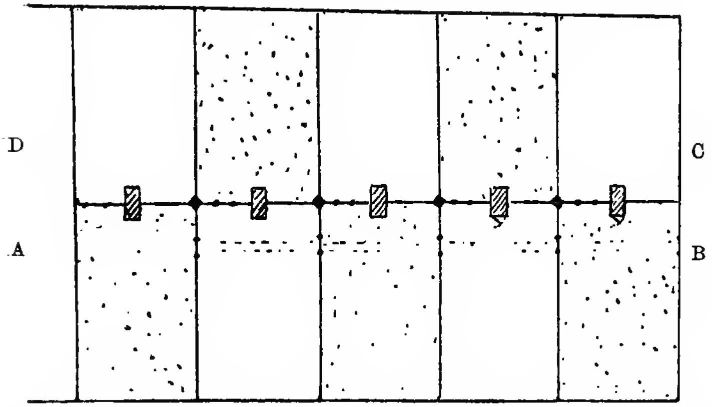
DOUBLE FOWLHOUSE.



Scale $\frac{1}{16}$" = 1 Ft.

Ground-plan of one of the double houses at the Ruakura Poultry-station. This plan can be strongly recommended for ten or twelve fowls. The runs, which are 50 square feet, insure a plentiful supply of grass throughout the year. A square run is much to be preferred to a long narrow one of the same area, for this reason: that in the narrow run the grass quickly gets worn off.

Plan of Double Fowlhouse with Alternative Runs.



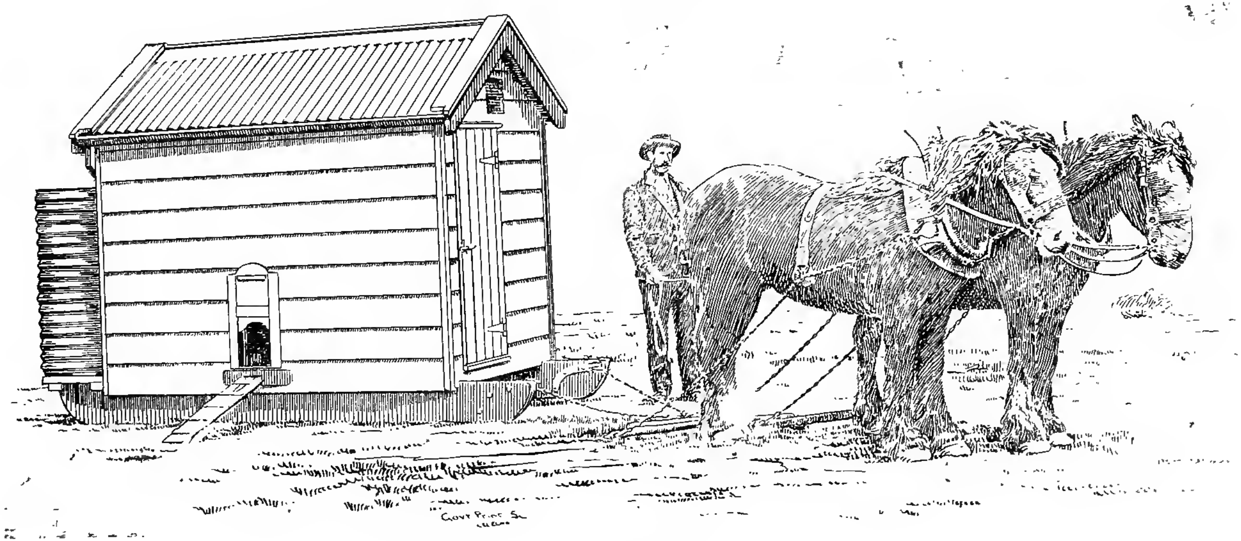
This illustration shows a system of double houses and double runs. The runs measure 50 ft. by 30 ft. The houses measure 6 ft. by 12 ft., and have a central division.

Note.—Through inadvertence the gateways are omitted from the plan. These should be in line through the runs from A to B, and from C to D.

Duck-houses.

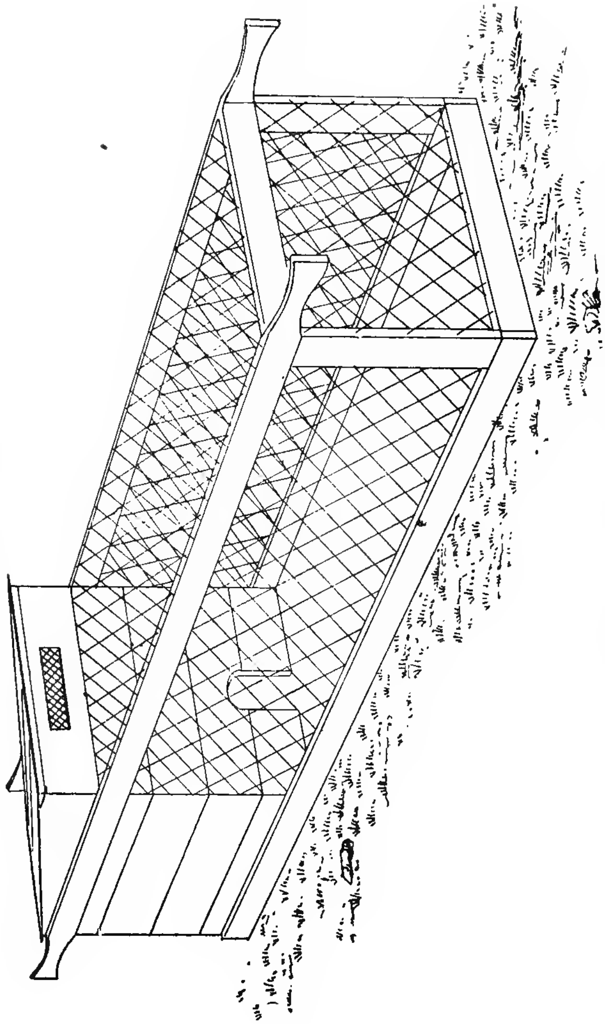
The cheapest style of house is one with a slanting roof. It should be 6 ft. high in front and 4 ft. 6 in. high at the back. Windows of sufficient size to admit light should contain one sash of six lights, 9 in. by 12 in., for 10 running feet of the building. Provide plenty of ventilation. The ventilators should be near the roof, and so arranged that there will be no draught. Seven square feet of floor-space should be provided for each bird. Wire netting 2½ ft. in height will be ample to divide the flock. The interior of the building must be kept clean, and dry straw used for beddings. The birds will make their own nests in the straw, so there is no need to provide nest-boxes.

Movable House as recommended to Farmers.

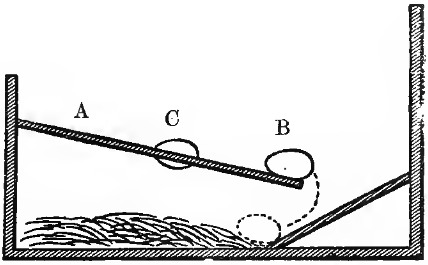


Perches.

The perches should not be placed high, or so that the heads of the birds can come on a level with the ventilator. There is no occasion for the perches to be more than 18 in. from the ground, and they should be all on a level. The step-ladder style that is generally adopted is a mistake; the fowls will invariably try and get on the top perch, which is generally near the roof, and the air they breathe becomes vitiated, and disease follows. Do not nail the perches, but have them fitting into a slot, so that they can be easily removed, and the ends dipped into kerosene occasionally. A perch should be 2 in. wide by 3 in. deep, made of sound timber (if there are any cracks it will harbour vermin), with just the rough edge taken off, MOVABLE COOP.

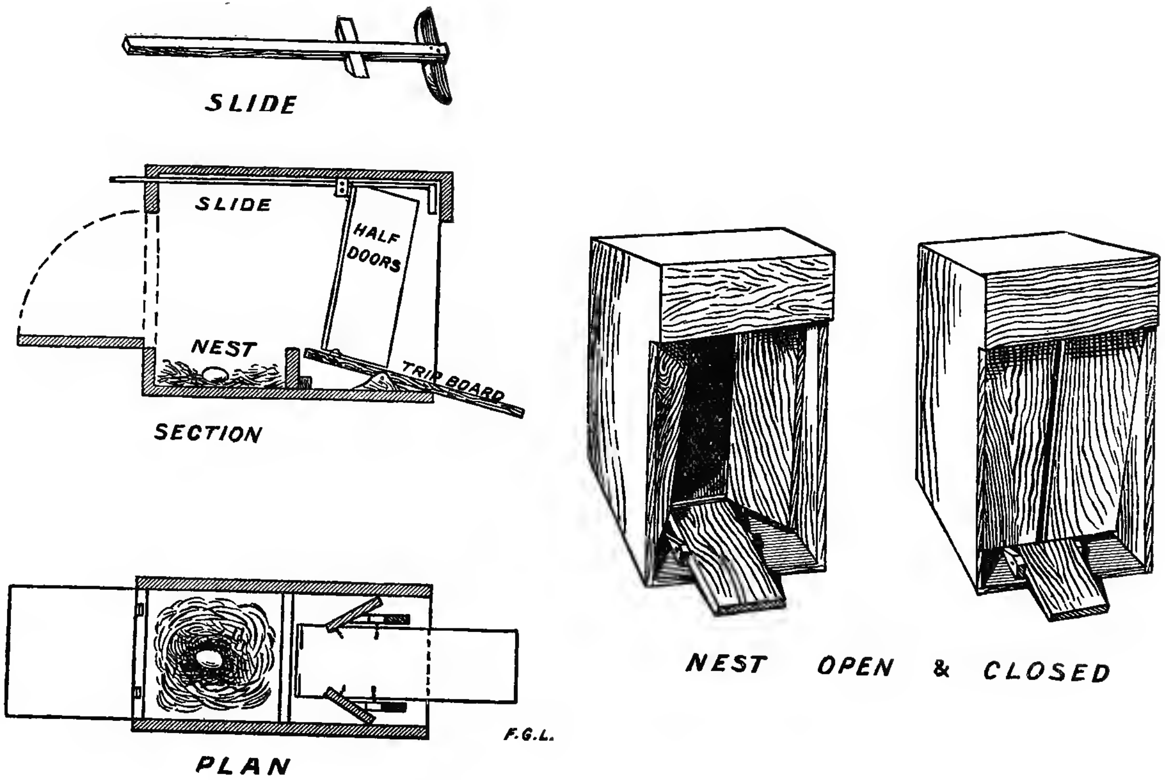


For spare cock, or hen and chickens. The run connected with this coop would be much better if boarded up on one side to protect the birds from very hot sun or wind.



SAFETY NEST

Figure A is an inclined board, and should be covered with carpet or similar material; matting would be better, and tarred felt best of all. The egg, as in Figure C, is a china one, cemented half-way through the board. B is the egg rolling down to the straw on the bottom.

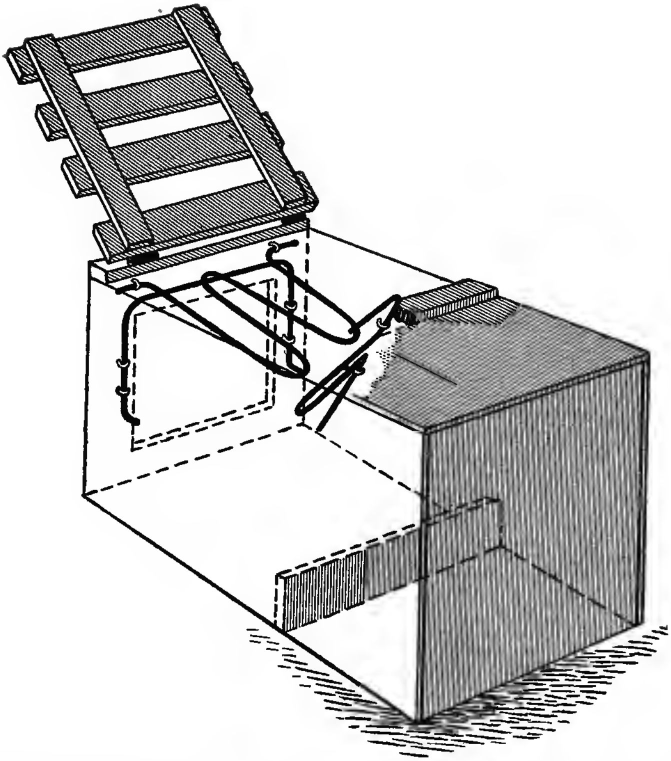


RECORDING NEST BOXES.

Recording nest-box (trap nest), as illustrated in Lewis Wright's Book on Poultry.

New Trap Nest.

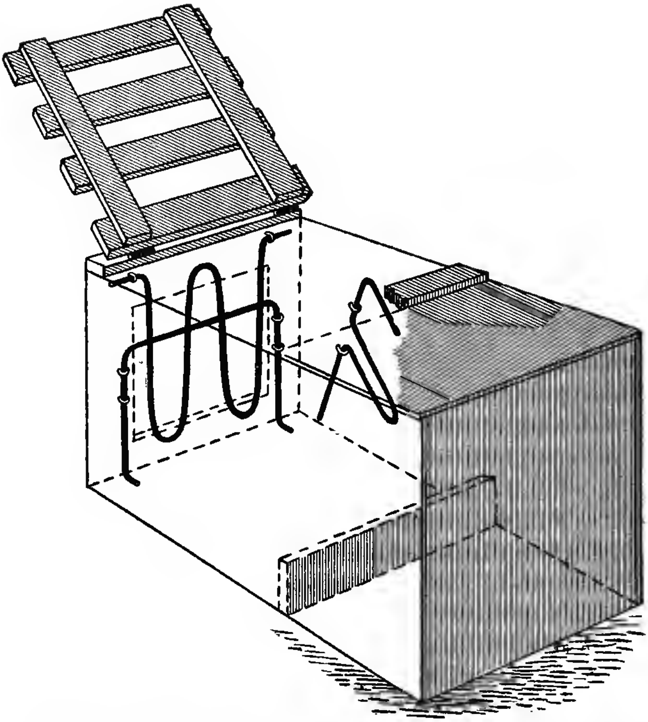
No. 1.



The above illustrated trap nest was designed by Mr. J. Stewart, plumber, Invercargill, and is so simple that any handy man can make it. The trap can be made with ordinary fencing-wire, bent as illustrated. The box is 2 ft. deep, 15 in. wide, and 16 in. high. A piece of 3 in. by 1 in. timber is nailed inside the box, 12 in. from the front, to form the nest.

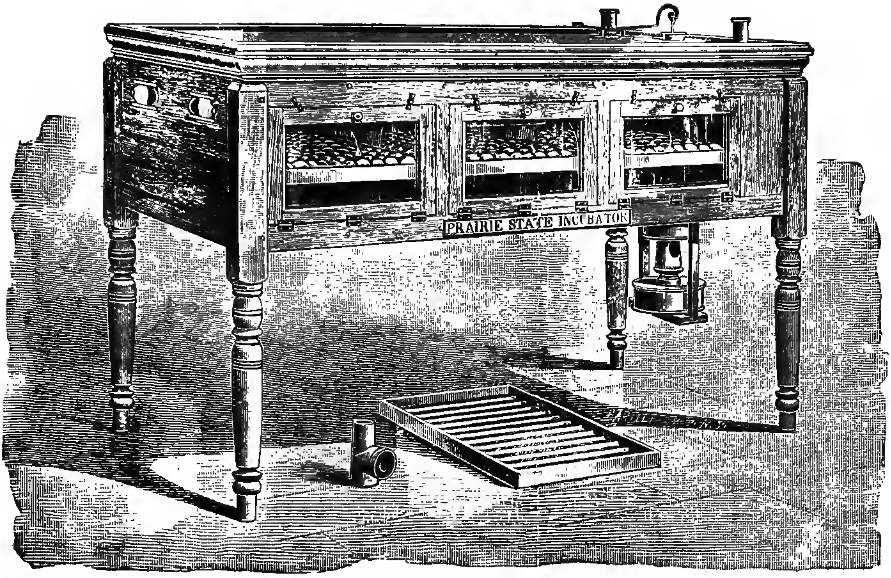
New Trap Nest.

No. 2.



Shows trap closed, the lid being lifted to show the mechanism.

ARTIFICIAL INCUBATION.



Prairie State Incubator.*

Where it is intended to breed a large number of chickens an incubator and foster-mother are indispensable. When the ordinary method of incubation is adopted, vexatious delays often take place through the scarcity of broody hens. Even where a large number of fowls are kept there will be very few hens wanting to sit in cold weather, and valuable time is lost, and sittings of eggs that have been carefully saved are wasted because no broody hens are to be had. By using machines eggs can be hatched at any time. There are other advantages—viz., the eggs are not crushed, as so often occurs with hens; the machine does not leave the eggs, neither does it cover the young chickens with vermin, and it costs less for kerosene to hatch out, say, one hundred chicks than it would to feed the number of hens that would be required to do the same work. Of course, it is necessary to get an incubator of a reliable make. I have used, and can recommend, Hearson's, Prairie State, Jubilee, and Cyphers machines. There are many other good incubators in use, no doubt, but I simply mention those that I have personally used and found to be excellent and easily worked.

It is important to have the incubator standing upon a solid floor—the less the vibration the better. The temperature should be as equal as possible in the incubator-room; there should be no draught. The incubator should be so placed as to allow air to pass freely all round it.

When the incubator is purchased, it should be well tested, and the working of it thoroughly mastered, before the eggs are put into the drawer.

When the chicks are hatched they can be easily reared, in the coldest weather, by the aid of artificial mothers.

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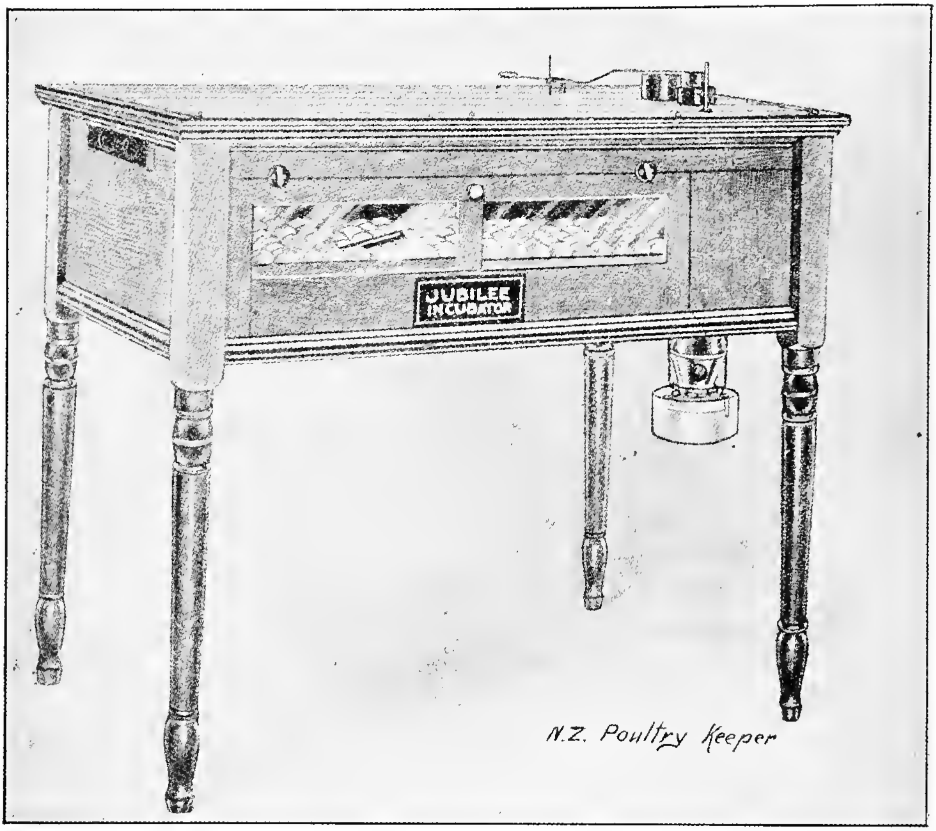
* I am indebted to Messrs. Paterson and Barr, Dunedin; E. W. Mills and Co., Wellington; and A. E. Lawrence, Christchurch, for the loan of the blocks of the various machines illustrated under this heading.

Jubilee Incubator.



Care of Lamp.

The lamp should be filled every day with oil of the best quality. Always have sufficient flame turned on to keep the valve slightly open. Do not turn the flame up high enough to smoke, or soot will collect in the flue. Carefully cut the corners off the wick. Keep the burner free from dirt, and wipe from the lamp any overflow of kerosene

Eggs.

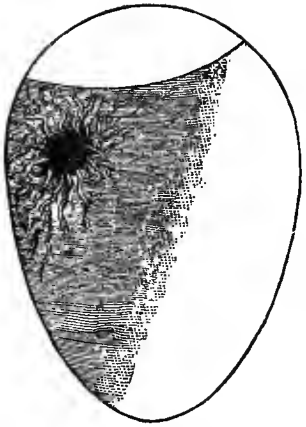
Eggs should be as fresh as possible; but a good hatch may be obtained from eggs three weeks old, especially if the weather is cool and the eggs are turned every twenty-four hours.

Giving fattening foods to birds that are used for breeding from should be avoided. Eggs should be collected regularly and placed in a room where the temperature is never below 40° or higher than 65°.

Temperature.

The proper temperature for either hen or duck eggs is 103°. There need be no alarm if the temperature should run up to 107° for an hour or two; but if left longer the germ will be destroyed. Place the eggs in the drawer so that the large end has the highest position.

TESTING EGGS.

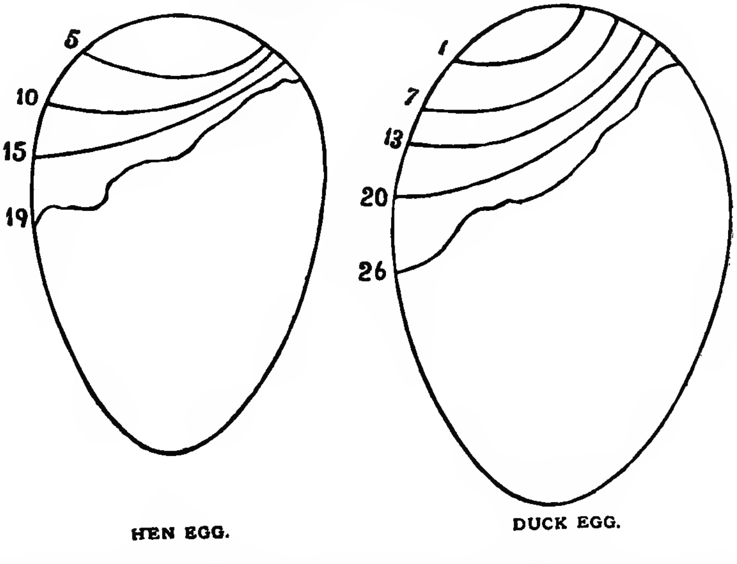


Fertile Egg.

This is a very necessary proceeding, in order to remove any infertile or dead eggs. As there is a difference of about 3° between a dead and a live egg, there is a danger of the thermometer bulb resting on a bad one, and the live ones becoming overheated. The best time to make the first test is on the fifth or sixth night. Hold the egg between the forefinger and thumb, or in a tester that is usually supplied with incubators ; look through the egg at a strong light. If the egg is fertile it will appear like that shown in the margin, and slightly red in colour; if addled, a black spot will be visible; if infertile, it will be quite clear. The latter may be used for culinary purposes, or boiled for chickens already hatched. A second testing about the twelfth day is advisable.

An ordinary small lantern or bicycle-lamp may be utilised as an egg-tester by fixing a piece of cardboard (in the centre of which an opening the size and shape of an egg has been cut) over the glass. The rays of light are thus focussed through the egg. Reliable results are obtained in this way.

DEVELOPMENT OF THE AIR-CELL.



HEN EGG.

DUCK EGG.

A capital plan is to also note the development of the air-cell; it becomes larger as the chick develops. The diagrams shown above will give the development that should take place.

VENTILATION AND MOISTURE.

The moisture or air-saturation is affected by the size of the opening of the ventilators. A wide opening of the ventilators will reduce, a small opening will increase, the moisture. With a wide opening the air moves through the machine rapidly and carries the moisture out. In starting the machine open the ventilators, and gradually close them as necessity demands. Thin, porous shells dry rapidly, while thick shells are slower, and if eggs from different varieties are placed in the machine at the same time an average will have to be struck.

START ALL THE EGGS AT ONE TIME.

When starting a machine put all the eggs in that you intend for that particular hatch, as it is quite a mistake to put additional eggs in from time to time.

TURNING AND COOLING THE EGGS.

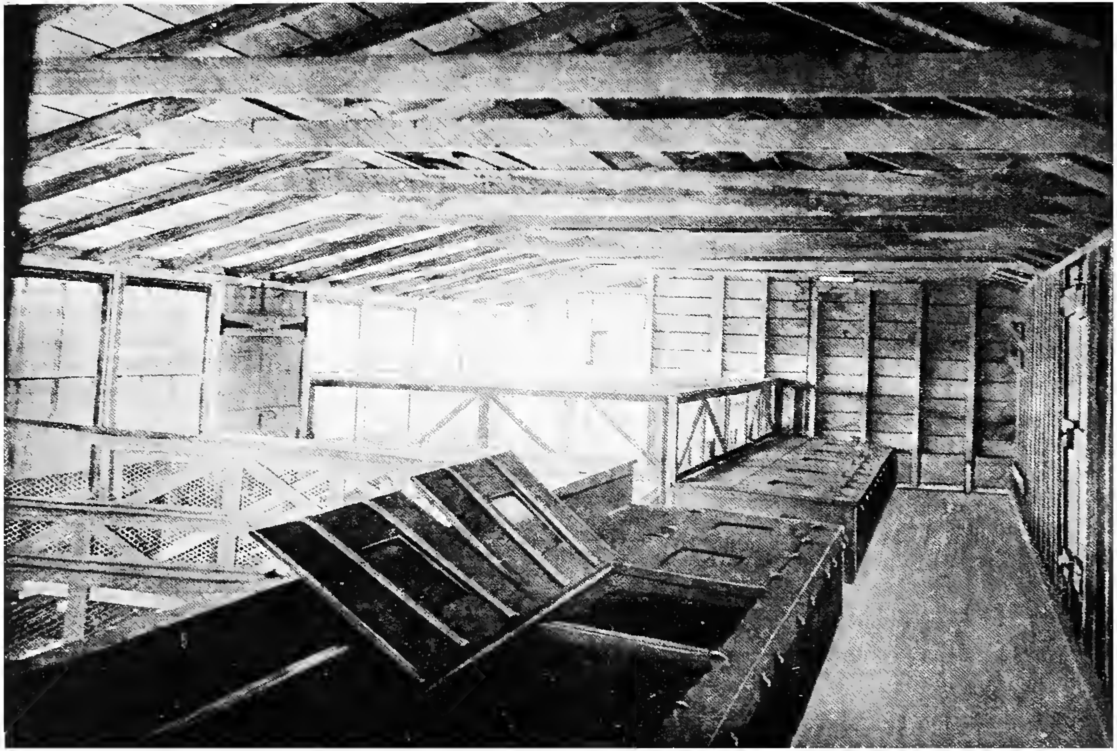
Turn the eggs night and morning after they have been in the machine forty-eight hours. It is well to mark the eggs on one side thus ×, so that the marked side is visible on one occasion and out of sight next. Allow them to cool about ten minutes at first, and gradually increase the time till the third week; they may then remain out of the machine from thirty to sixty minutes, according to the weather. It is advisable to change the position of the eggs occasionally; those that are on the outside of the tray one day should be placed in the centre the next. Cease turning the eggs so soon as they commence to pip (*i.e.*, as soon as the chickens crack the shells), and on no account allow the incubator-door to be opened after that till the hatch is completely over. Remember this is a very important point, and do not allow your curiosity to make you forget it.

CRIPPLED CHICKS.

This trouble is caused through the chicks being in the shell too long, and the heat being allowed to run too low or too high at some time during the incubating period.

BROODING CHICKS.

Success in raising chicks lies largely in preventing them from becoming chilled. Another important point that should be remembered is not to leave the food in the brooder longer than is absolutely necessary, as, owing to the heat, it quickly steams and becomes sour. Many chicks die or droop because too much heat is given, and continued longer than necessary. The heat in the brooder for the first week should be 90°, and be gradually reduced according to the weather. Use a reliable thermometer, so that you will know to a certainty what temperature you have. Remember the chicks must have exercise and fresh air; do not coddle them, or they will become stunted in growth. Do not have chicks of various ages run together, as the big ones will rob the younger birds of their share of food. Do not let the chicks get wet; the drinking-vessel should be so arranged that the birds can reach the water with their beaks only. Do not allow the chicks to get a chill when removing them from the incubator to the brooder; use a piece of flannel or blanket to cover them. Clean water should be kept constantly before them. It is most important that young chicks should for the first three or four days spend all their time in the brooder. Then begin to let them outside, penning them near the brooder to prevent them straying away and getting chilled.



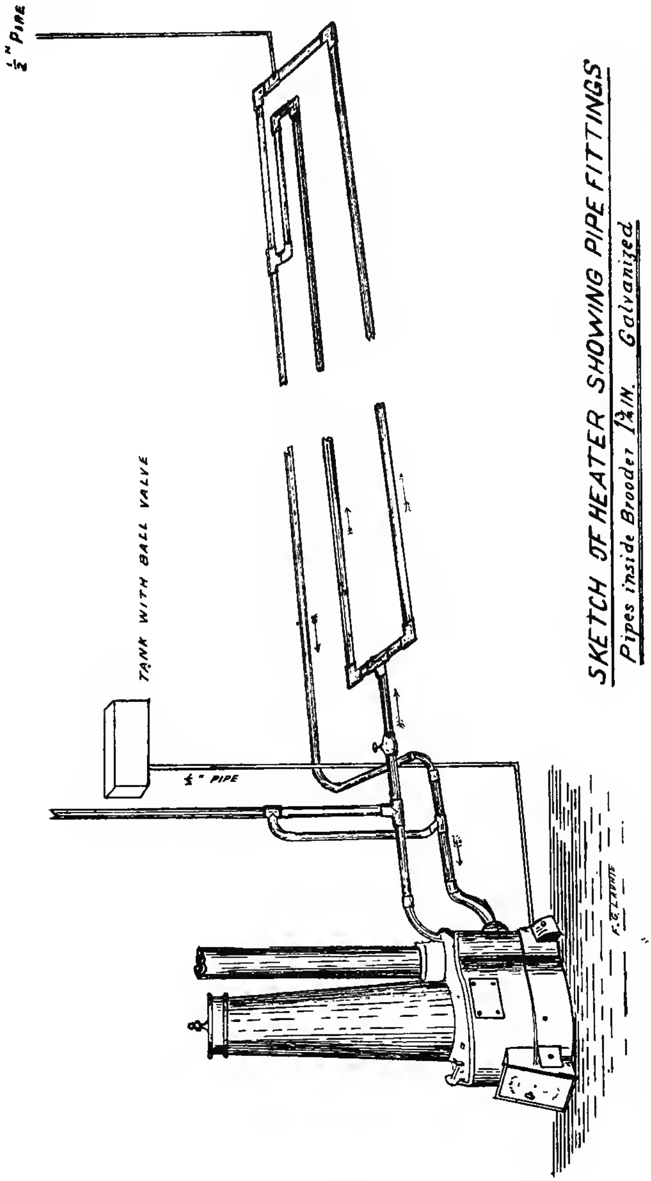
To face p. 57.]

BROODER AT MOMAHAKI EXPERIMENTAL STATION.

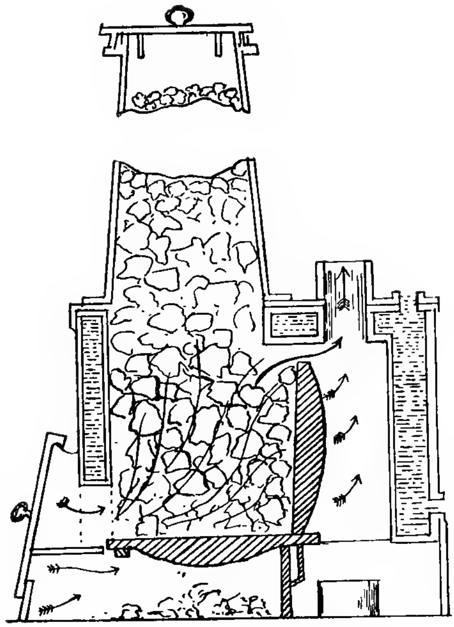
Chicks should be brooded for about six weeks, according to the weather; a little experience will soon determine this. The brooder must be kept clean, and fine sand or dry earth ¼ in. to ½ in. in depth covering the floor. Pine-needles are also very suitable for this purpose.

BROODERS AT MOMAHAKI AND BURNHAM POULTRY-STATIONS.

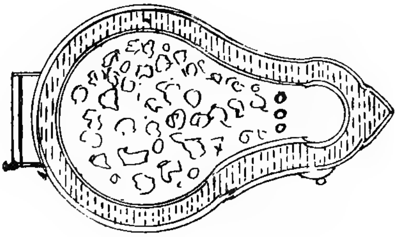
No. 1.


½" Pipe
Tank with ball valve
½" pipe
SKETCH OF HEATER SHOWING PIPE FITTINGS
Pipes inside Brooder 1¾ IN. Galvanized

No. 2.

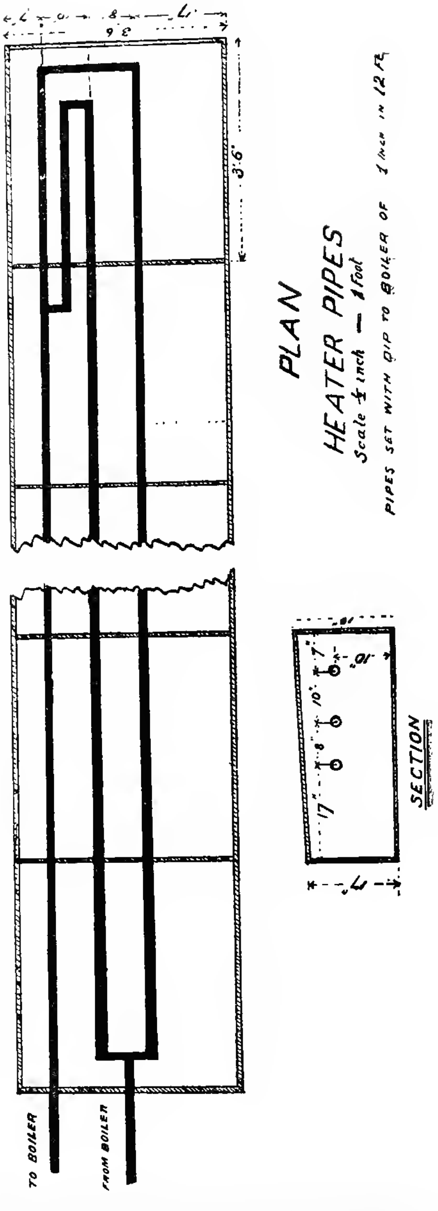


SECTION No 3 BOILER

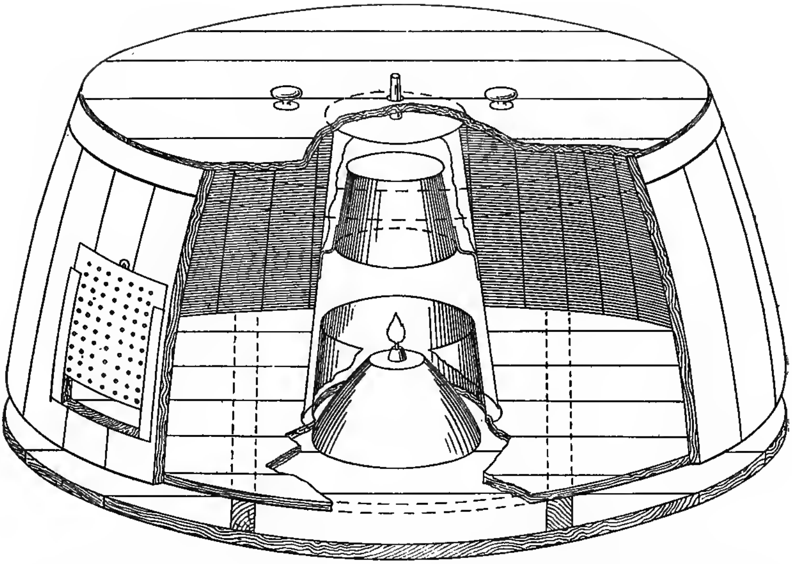


HORIZONTAL SECTION

No. 3.



These illustrations (Nos. 1, 2, and 3) give details of the twelve-hours stove and the pipe arrangements for the brooders as used at the Government poultry-stations at Momahaki and Burnham. For those who wish to raise a large number of chickens this system can be recommended, first, on account of the small cost at which the stove can be run, and, secondly, because of the great saving of labour.



Calway brooder. A cheap and useful brooder for thirty-five chicks, made from portion of cask.

FEEDING CHICKENS.

Chickens should not be fed for twenty-four to thirty hours after they are hatched, as nature has supplied all they need up to that time. They should then be supplied with a small quantity of hard-boiled egg, bread-crumbs, and oatmeal, mixed with milk if you have the latter to spare, and made just moist enough to break easily. Avoid above everything giving chickens sticky or sloppy food, and do not give more than they will eat up clean at a time. For the first week they should be fed during the day every two hours, and for the second week every three hours.

The chick should, from the day it leaves the shell until full growth is reached, be made to gain weight. There must be no check, or it will cost far more in food to bring the bird to maturity.

In feeding chicks, a good plan is to get a clean board and sprinkle the food over it, adding more if necessary. When the chicks have had sufficient, remove the board. The latter should be kept thoroughly clean. Discontinue giving hard-boiled eggs after the second day. Then give coarse oatmeal, following with crushed wheat, barleymeal, maizemeal, &c., aternately. It is advisable to sift barleymeal and rolled oats through a sieve, in order to remove the husks. It will be found a great advantage to feed young chicks, especially during the early part of the season, at about 8 o'clock at night, as it is too long for them to go without a meal from, possibly, 5 o'clock in the evening till 7 the next morning. It is an excellent plan in very cold weather to slightly warm the drinking-water for chicks.

A little hemp, millet, and canary seed given occasionally makes a nice change. Keep them well supplied with short-cut green food, but do not leave any lying about to get trampled upon and go sour.

Mix one teaspoonful of sulphur with the soft food for thirty chicks twice a week.

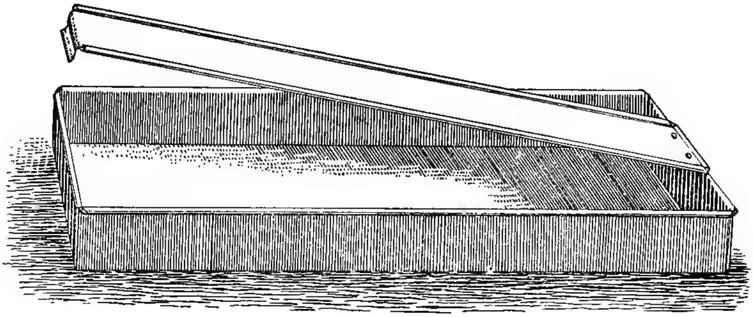
See that they have plenty of fresh clean water. Have the drinking-vessel thoroughly clean, and never on any account leave the water in the sun.

The following is a good food for chicks: Mix equal parts Indian corn, barley, and oats (all ground), and add a small quantity of bran; make the whole into bread by using sour milk, and bake; then crumble and make to proper consistency with scalded milk.

Remember, grit is as essential to chicks as full-grown fowls. Charcoal is also valuable as a preventive or corrective of digestive trouble.

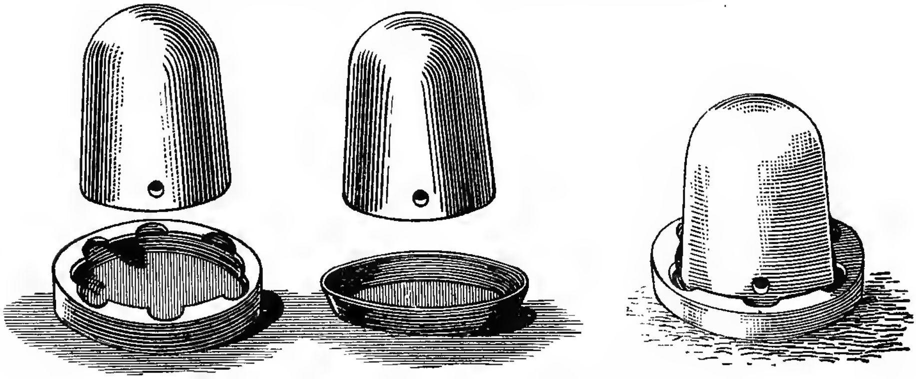
Do not allow chickens and old fowls to roost together, as it tends to stunt the growth of the young birds.

Drink or Food Trough for Chickens.



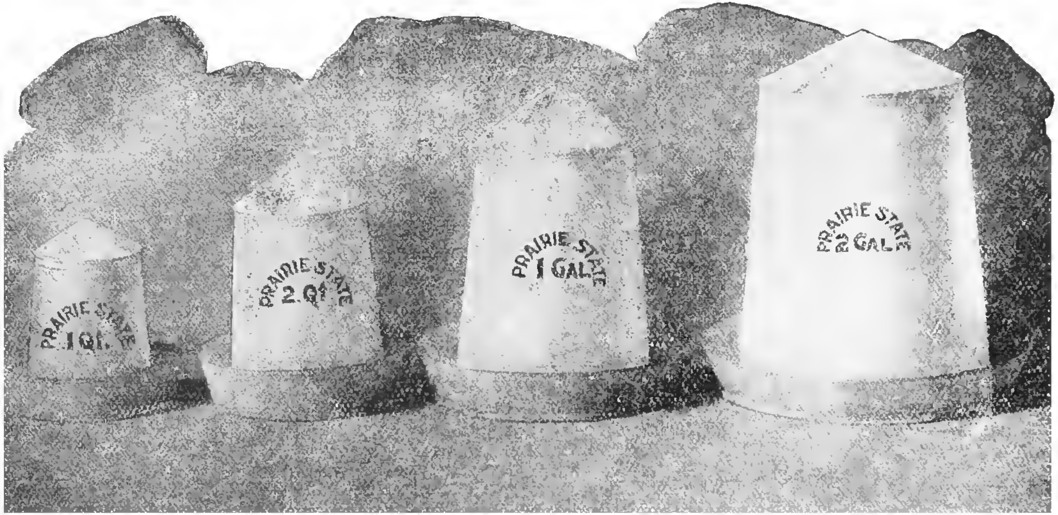
This can be used for either water or food for young chickens. The design is original, and will appeal to all poultry-breeders. Size: 18 in. long, 4½ in. wide, 1½ in. high. When the band through the centre is closed it prevents chicks from getting wet, if the trough is used for drinking purposes; if for food, the birds can only get their heads between the band and the side of the trough, and thus the food is not trampled upon and wasted. The vessel can also be easily cleaned, which is important.

Earthenware Drinking-fountain for Chickens.



Made at Milton, New Zealand.

PRAIRIE STATE DRINKING-FOUNTAINS—IMPORTED.



DUCK-RAISING.

This is a branch of the poultry industry that is being rapidly taken up in this colony, and rightly so, as there is money in it, as ducklings can be marketed when they are twelve weeks old.

It is unwise to have ducks and fowls running together. Keep them entirely separate.

Although it is not absolutely necessary to have a pond for ducks, when such is available there will be a better percentage of fertile eggs. The young birds should only have access to the pond once a week, in order that they may have a thorough good wash. Too frequent bathing will retard growth and reduce the condition of the birds.

Ducklings should be kept in small runs, so that they can be got ready for the market as early as possible, which must be when they are about twelve weeks old; if kept longer they will go into moult, and lose condition rapidly. If allowed a big range their growth will be much slower.

It is advisable to breed only white-plumaged birds—viz., Pekin and Aylesbury. The latter breed is the most suitable for the London markets, but the Pekin is hardier, and the better layer of the two.

America is the greatest duck-producing country in the world; there are quite a large number of breeders there that market from five to twenty thousand birds a year each. To the adoption of artificial incubation must be credited the large growth of the duck industry. Without this method it could never have attained its present development.

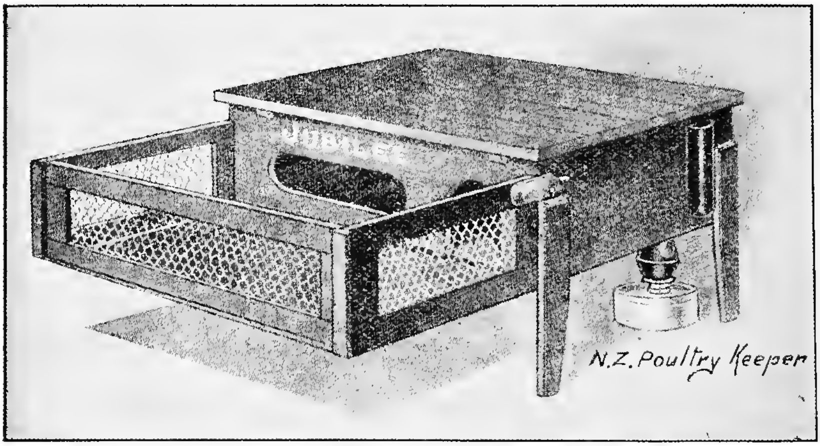
Allow four to five ducks to each drake for breeding purposes.

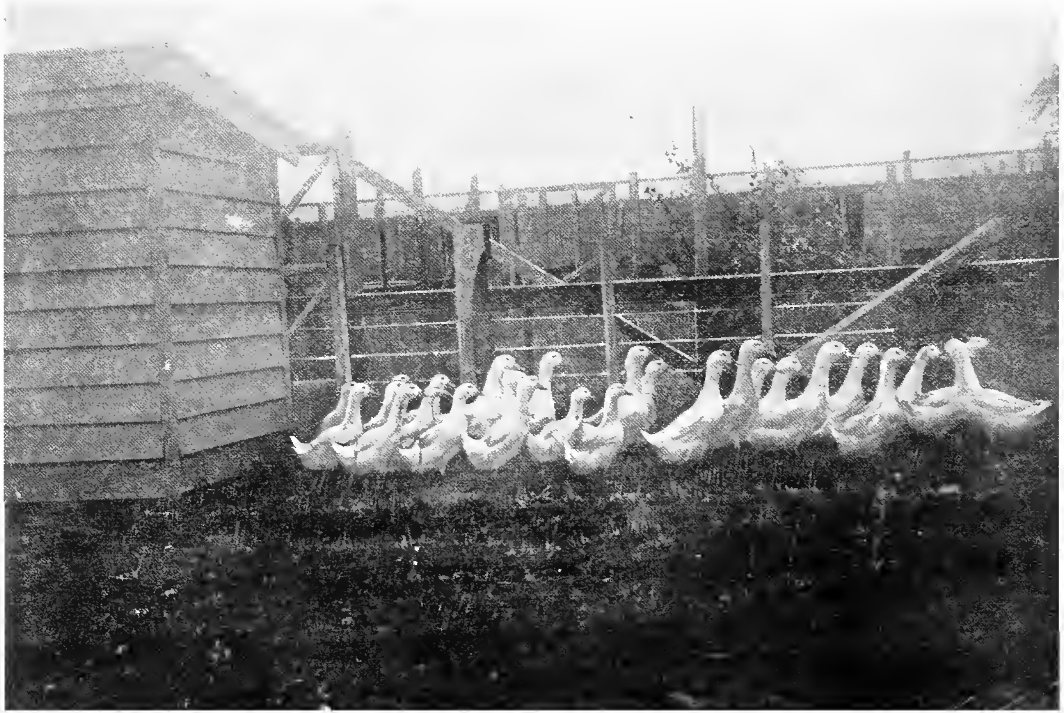
The best time of the year for hatching is October and November, as the eggs are better fertilised at that time.

BROODING AND FEEDING DUCKLINGS.

The temperature of the brooder should be 90° before the ducklings are placed in it, and that heat should be maintained for the first three days. After that the temperature should be gradually reduced. If you find the ducklings crowd together you may be sure more heat is necessary. Give them liberty away from the brooder by degrees, as they are liable to lose their way and get chilled, which would be fatal. Should you find them huddled outside the brooder put them back under the "hover."

Jubilee Brooder.





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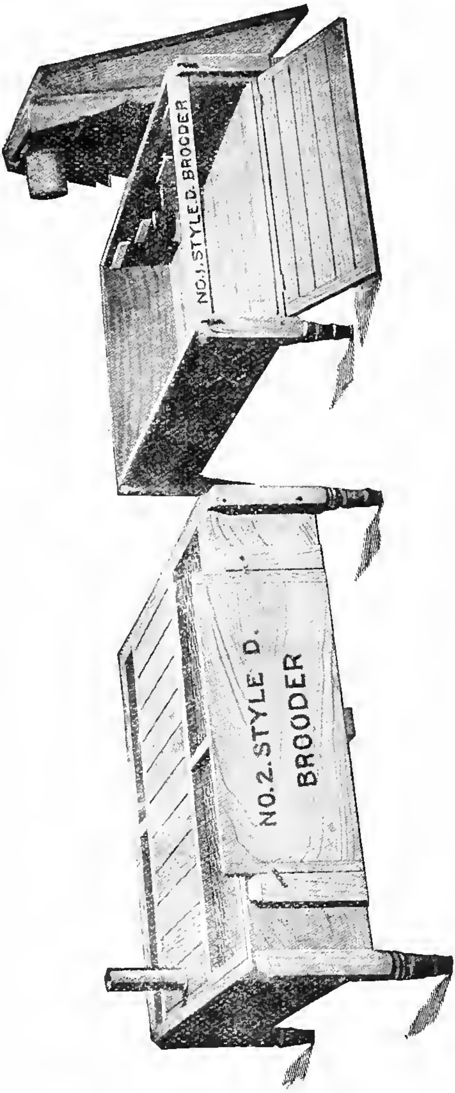
YOUNG PEKIN AND AYLESBURY DUCKS AT MOMAHAKI.

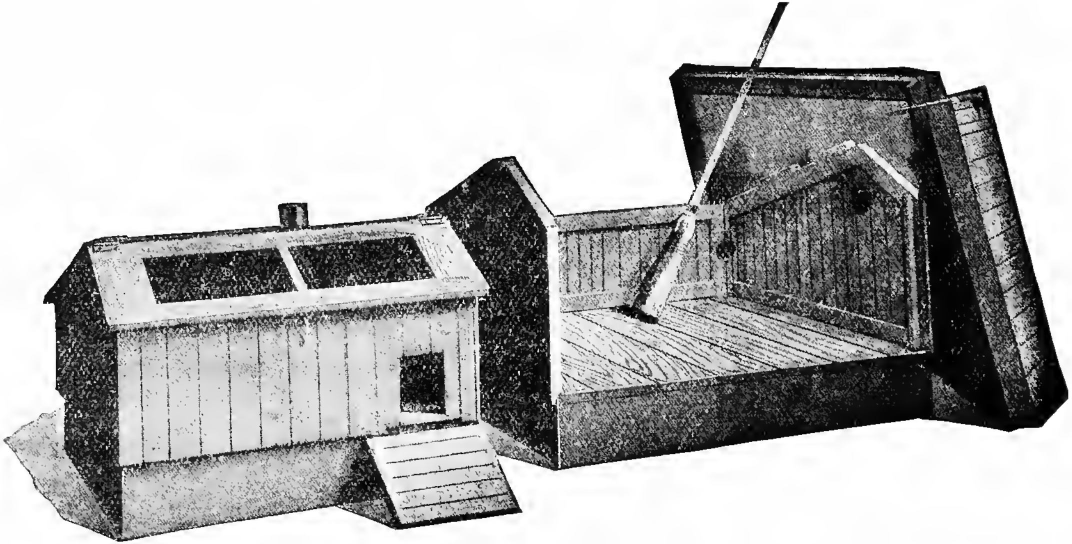
Their first feed should consist of two-thirds bran mixed with oat or corn meal, to which should be added 10 per cent. hard-boiled egg and 5 per cent. small sharp grit. They must have an ample supply of water, particularly at feeding-time. Never give more food at a time than they will eat up clean. After the birds are a week old do not mix grit with their food, but keep it within easy reach of them so that they can help themselves. Ducklings should be fed every two hours the first week, every three hours the second and third weeks, after that three times a day. At first give 2 per cent. meat (that has been passed through a mincing-machine), and increase it about double each week up to the fifth week. Provide short-cut green food at all times, and boiled potatoes, turnips, and other vegetables should be given occasionally. Ducklings should be fed from troughs. If the food is thrown to the ground for them they will trample on and waste a large quantity of it. Remember that sharp grit and crushed oyster-shells are absolute necessities for ducks, young and old.

Prairie State Brooders.
No. 1.



No. 1, Style D, and No. 2, Style D, as shown above, are indoor brooders. The No. 1 is 80-chick and the No. 2 125-chick capacity.

No. 2.



No. 1, Style C, and No. 2, Style C, as shown above, are outdoor brooders, with 100- and 150-chick capacity respectively.

BREEDING GEESE.

TOULOUSE GOOSE.

The breeding of geese can be carried on profitably, as they feed mainly on pasture. It is, however, advisable to give the old birds a little soaked grain at night in order to induce them to come home. There are a number of varieties of geese, but the most desirable to keep are the Toulouse and the Embden. The average number of eggs laid is about thirty a year. The number of geese with one gander should be two or three. The best time to mate them is in their second year, and they should be dispensed with when they are ten years old. It is better to use large hens, not geese, to incubate the eggs, giving each hen from four to six eggs. The length of time required to hatch is twenty-nine to thirty days. Sprinkle the eggs occasionally with warm water. When the birds are hatched, feed them in the morning as already described for ducklings. Keep the young birds away from the pond or stream until they are nearly feathered, but always have clean water before them to drink.

EMBDEN GOOSE.

The Embden, being a pure-white colour, present a much more attractive appearance when dressed for the table than the dark-plumaged birds, owing to the objectionable dark pin-feathers in the latter.

TURKEY-RAISING.

The first and most important requirement in turkey-raising is strong, vigorous stock. The birds thrive best upon high and dry land, and especially where there is plenty of scrub. The greater the range you give them the better; they will then to a large extent find their own living. They do not reach maturity until they are three years old, so it is quite a mistake to breed from birds under two years of age. The male should be either two or three years old: a frequent change of blood is essential.

The hens lay from twenty to thirty eggs and then become broody. The period of incubation is twenty-eight days. The chicks are very stupid at first, and a good plan is to place two or three hen-eggs with the turkey-eggs a week after the latter have been started. These chickens will teach the young turkeys to pick up their food. Particular care must be taken not to overfeed the breeding birds, and avoid using a young gobbler and pullets of the same flock. It is not advisable to run more than eight or nine hens with a gobbler. Do not fail to keep the nest and the turkey-hen free from vermin by using insect-powder at least twice during the time she may be sitting, or there will be little hope of raising the poults when hatched. Twenty-four to thirty-six hours after the chicks are hatched provide food for them as follows: Stale bread soaked in milk and squeezed dry, adding a small quantity of hard-boiled egg, and occasionally give rice that has been boiled in milk. Oatmeal, barley-meal, and maizemeal can be given. The food must be mixed to a dry consistency. Do not forget short-cut green food. Meat passed through a mincing-machine is beneficial. Sharp grit is necessary. Keep young turkeys longer on soft food than other chicks. Great care must be taken not to feed the young birds too much at one time, and if it can be prevented never allow the poults to get wet; a good soaking is fatal to them.

RISKS OF INBREEDING.

I am frequently asked whether there is any harm in breeding from a cockerel and pullet that have been hatched from the same sittings of eggs. Breeding from a full brother and sister is of course wrong, but the probability of such a close relationship between two birds from the same sitting is very remote, the chances being about 30 to 1. Where eggs are obtained from the Government stations the chances are still more remote, as three or four unrelated pens of birds are usually kept at each station, and eggs are selected in order to minimise as far as possible the chances of inbreeding.

FOODS FOR POULTRY.

The following foods are suitable for poultry :—

Wheat, barley, oats (Sparrow-bill), maize, rice, rye, millet, buckwheat, peas, beans, linseed, vetches, hemp-seed, rape, sunflowers, poppy, acorns (crushed and dried), potatoes, turnips, mangolds, sugar-beet, carrots, artichoke, swedes, ricemeal, wheatmeal, barleymeal, maizemeal, ryemeal, rapemeal, linseed-cake, sunflower-seed cake, poppy-seed cake, malt, brewers' grains (these should have meal mixed with them, a small quantity of oil-cake should be added).

Good clover hay can be used with splendid results. The hay must be steamed or soaked in hot water after being chaffed. White-clover hay is the best. This should be mixed with the soft food.

Green-cut bone, lean meat, fish, fresh milk, skim-milk, buttermilk, and whey are excellent.

FEEDING FOWLS.

General Directions.

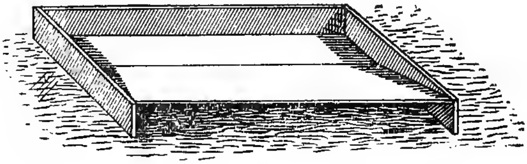
Very few poultry-owners have the slightest idea how to feed fowls. In nearly every instance the birds are either underfed or overfed ; the feeding is done irregularly, and the food is not of sufficient variety. Another great mistake made by many people is that they think any quality of food will do for poultry, and they give their fowls damaged or poor grain that they cannot use for anything else.

Indian corn is used altogether too liberally, especially in the north : many people use it week in and week out for their birds. This should not be done, as it is too heating and fattening, and should not be used more than twice a week. Never give fowls more food than they will eat up greedily. In the morning they should be fed on sharps, pollard, bran, boiled potatoes, bread, or meal of any description, such as buckwheat-meal, oatmeal, barleymeal, &c. The reason for this is that the hard corn takes a much longer time to get soaked in the crop and ground in the gizzard, while soft meal passes at once into the system, and thus gives the birds immediate nourishment. The above should be mixed with warm water, and not made sloppy. The food should be mixed up so that it will break up easily, and should be placed in troughs, as if thrown to the ground the birds run over it. Should there be more than the fowls care to eat, remove it at once, or it will quickly sour and become wasted. Use a sprinkling of salt with the above, and add, twice a week, about 2 oz. of bonemeal or green-cut bone for each fowl.

If your fowls have an unlimited run they will only require to be fed twice a day; but if confined in a small space a light midday meal necessary, which should consist of table-scraps. A good thing to give is meat, either cooked or raw, twice a week. Arrange with your butcher to get the scraps; they can be got at a very low price. Give plenty of green food, such as short-cut grass, clover, cabbage, lettuce, watercress, &c. Root-crops of almost any description is splendid food for fowls, such as potatoes, mangel-wurtzels, turnips, &c.; the two latter should be cut in two and thrown down for the birds to peck at.

The evening meal should consist of wheat, short thick oats, Indian corn, buckwheat, and barley. The latter should be steeped in water for four or five days, and then dried in the sun, as when it is treated in that manner the birds will eat it greedily. Another way is to pour boiling water over the barley, then place a sack over the vessel and allow the grain to steam for half an hour. Other kinds of grain may be treated in the same manner occasionally; it makes an acceptable change for the fowls. Onions cut into little squares and given occasionally are very good; also sunflower and hemp seed. Always bear in mind to give your birds a change of food as frequently as possible; they appreciate it as much as we do.

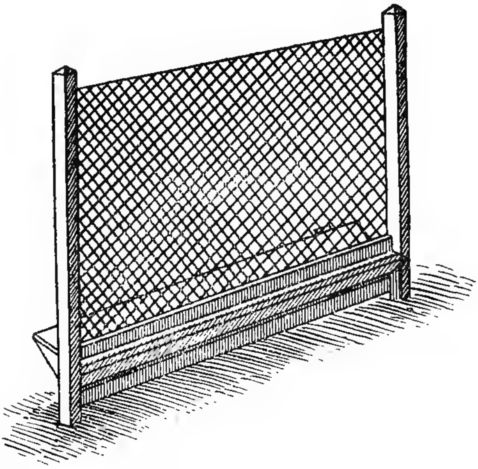
MIXING-TROUGH.



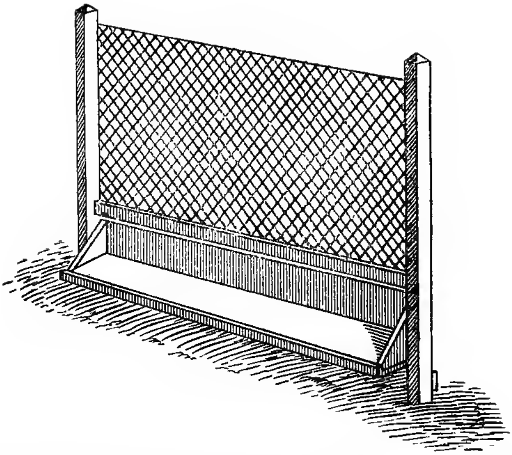
Convenient-shaped trough for mixing soft foods.

SWING FEEDING-TROUGH.

No. 1.

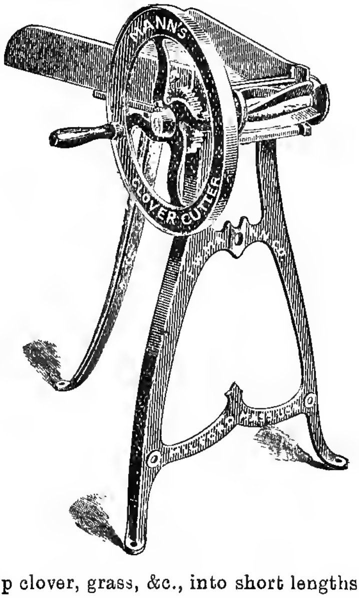


No. 2.



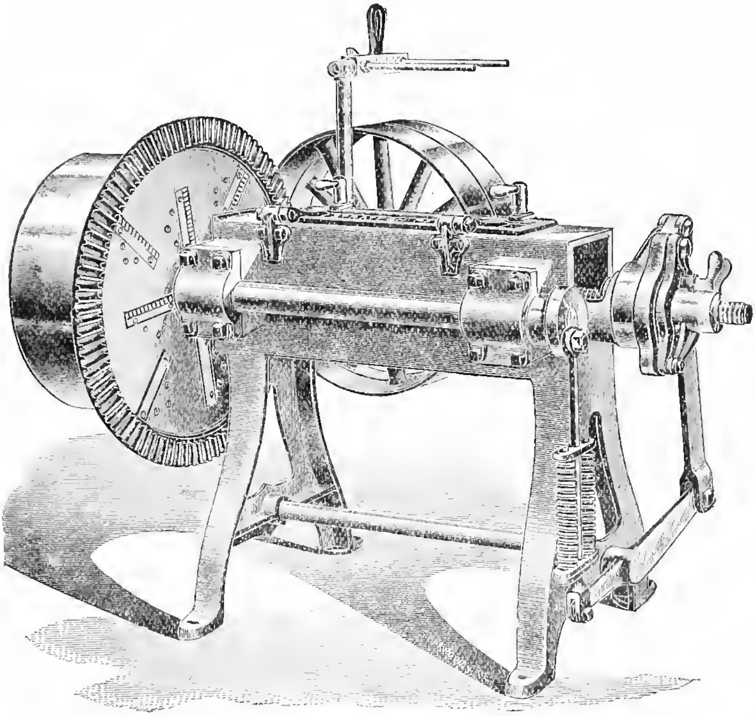
The illustrations (Nos. 1 and 2) show a portion of a fowl-yard fence with swing feeding-trough attached. This arrangement enables the attendant to feed the birds with soft food without entering the yard.

Mann's Clover-cutter.

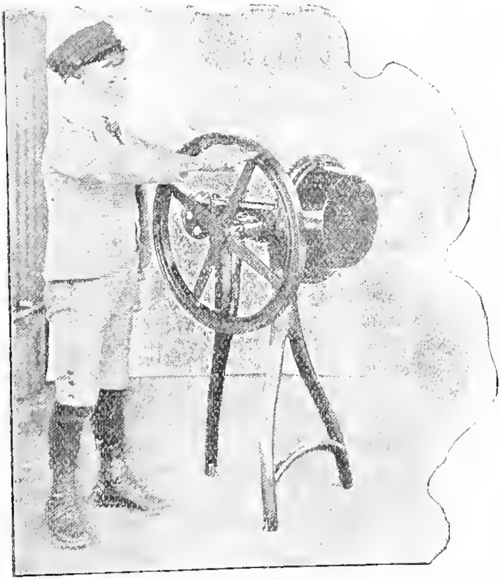


cutting up clover, grass, &c., into short lengths for poultry.

THE "DANDY" BONE-CUTTERS (Power or Hand).

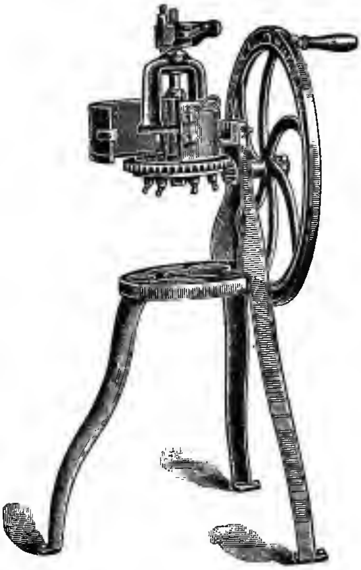


Power-machine.



Hand-machine.

THE "MANN" GREEN-BONE CUTTER.

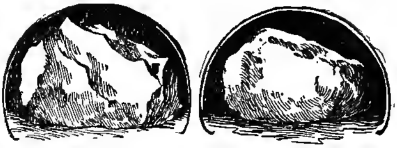


BONES, LIME, GRIT, AND CHARCOAL.

GRANITE CRYSTAL GRIT MAGNIFIED.
Crystal Formation.

Being Acted Upon by the Gizzard.

OTHER GRIT MAGNIFIED.
Homogeneous Formation.

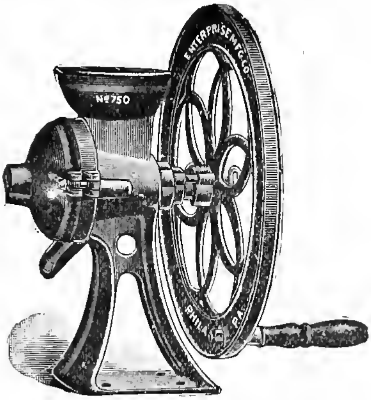


Being Acted Upon by the Gizzard.

If the fowls have not lime in some form or other it weakens the laying-hens, and often causes them to lay eggs without shells. When this occurs they are apt to break before the fowls can pass them, and when this is the case the fowls often die or are ruptured, and are frequently found dead on the nest or underneath the perch. I would recommend every one that keeps poultry to procure from an ironmonger a grit-mill (they can be bought from £1 up each, according to size); with that you can in a few minutes crush quite a large number of oyster-shells, which will supply just what is wanted to form the egg-shells. You can also crush dry bones, which is excellent food for fowls, and the bones if not treated in this way would be wasted. You can also break up old crockery, and even glass bottles, to supply sharp grit, which is indispensable for fowls, and acts as teeth for them to masticate their food. Keep the lime, grit, and charcoal in small boxes, so that the fowls can help themselves. A green-bone mill will soon pay for itself. One of these mills will cut green bones like shavings, to which adheres some flesh and ligaments which a hen can swallow easily. These bones can be procured from a butcher for a mere trifle, and 3 oz. or 4 oz. to each hen per week will furnish the best egg-food procurable.

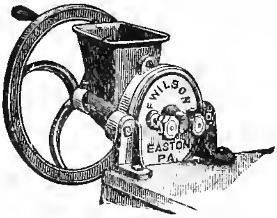
The illustrations shown herewith of bone-cutters and grit-mills are the same as used at the Government poultry-stations, and can be recommended.

BONE-CRUSHERS OR GRIT-MILLS.



These are excellent machines for breaking up damaged crockery or glass bottles, &c., for supplying sharp grit for fowls to masticate their food.

A SMALL-SIZED GRIT-MILL.



Those who have only a few hens are advised to procure one of these machines.

DOUGLAS MIXTURE.

An excellent thing for poultry, prepared as follows: 1 lb. of sulphate of iron and 1 oz. of sulphuric acid dissolved in 1½ gallons of water. Mix one teaspoonful to each pint of drinking-water. This should be given in cold weather or during the moulting season.

LIMESTONE.

A small piece of limestone placed in the drinking-water occasionally will be beneficial.

OVERFEEDING.

Too many fowls and chicks are annually killed by this mistaken kindness. The owner soon learns of the mistake by finding a big shrinkage in the number of eggs that are produced, many of the eggs having soft shells, some have double yokes, and others prove infertile.

CONSTITUENTS OF FOODS (LEWIS WRIGHT).

The constituents of foods may be classed as follows:—

1. *Nitrogen.*—The class containing nitrogen was formerly known as proteids, but is now usually called albuminoids, albumen being the chief type of the class. (The white of an egg is nearly pure albumen, mixed with much water). There are certain vegetable principles also which contain nitrogen in the form of ammonia; these are considered as less nutritive by some writers, and classed separately. There is no general agreement on this point, however; but, as most authorities class all nitrogenous compounds with the albuminoids,

we shall do likewise. Fibrin in animals, gluten in grain, casein in milk, and legumin in peas belong to this group, and serve, *if in proportion*, as nitrogenous food. That is the great principle to bear in mind.

2. The next class consists of fats and oils (often called *hydrocarbons*), and is specially rich in carbon. A certain portion of fat is necessary for the healthy body itself; so necessary that unless sufficient be supplied a certain portion of albuminoids will be decomposed by the system in order to form fat. Hence fat in due proportion is absolutely necessary in order to prevent such a wasteful use of albuminoids. Besides this, fats and oils find their chief work in supplying fuel for heat and energy.

3. The next class, known as *carbo-hydrates*, consists of carbon (in less proportion than in fat and oils), with hydrogen and oxygen in the proportions of water. Starch, sugar, and gum are the leading compounds of this class in the vegetable world. This group also supplies fuel for heat and energy, and has plainly more or less in common with the fats and oils class. It differs, however, in this respect: it is not directly represented, as the fats group is, in the animal body itself. Carbo-hydrates are, however, capable of being decomposed into fat. Thus they save waste of albuminoid foods; in other words, a due proportion of the carbon groups, as well as of albuminoids, is necessary even for the increase or the formation of lean meat or muscle.

4. One component of vegetable foods especially requires separate mention. *Cellulose*, the material of which tough cell-walls and woody fibre is composed, is of nearly the same chemical composition as starch. (Paper and cotton-wool are examples of cellulose). These and kindred materials exist in a much more indigestible form, so much so that in the case of some animals it is completely indigestible. Hence for our purpose we take the harder of such constituents into a separate class, and term it "husk" or "fibre." A certain portion of these may be useful as a mechanical stimulus to the intestines, but, except in the case of ruminant animals or birds, there is no portion digested, and consequently they are of little value as food.

5. The last class is that of *salts and minerals*. Phosphorus and lime are needed for the bones, sulphur for the feathers chiefly (the muscles require a small quantity also), salt for the whole range of the digestive processes, and alkaline salts to alkalinate the blood, &c.

In addition to the five classes above mentioned, there is in all foods a very variable amount of hydrogen and oxygen in the proportions that form water, and may be classed as such, though the water—as in the case of apparently dry wheat or flour—assumes in some way a solid form and may not be water in reality.

It is on the basis of these classes that food is analysed; and the problem to be solved in feeding or in a dietary is of the simplest kind from a theoretical point of view. It is to obtain a proper proportion between the albuminoids, or nitrogenous compounds, and the heat-producing groups of fats and carbo-hydrates. A dietary or food so arranged is called a properly "balanced" ration; and if we give such a dietary in proper quantity and in digestible forms the animal or bird will be properly fed. The actual proportion in any food or any dietary is called its "nutritive ratio." Thus a mixture of meals whose nutritive ratio is 1 : 6 means that the albuminoids therein are as one part (by weight) to six parts of fats and carbo-hydrates. But in calculating this ratio one important modification must always be made: "Fats" are much more fattening than starch or other carbohydrates, and are more efficient generally, because, as already noted, they are richer in carbon. In adding up the two groups, therefore, we must multiply the figure for fats and oils by some other figure, then we may add the product thus obtained to the carbo-hydrates, and reckon the total as one for the nutritive ratio. The precise figure to be used has caused some discussion, but the best authorities now consider that the correct figure is the equivalent of "heat" produced by the two groups. Accordingly, we must multiply the figure for fats and oils by 2·25 (or 2¼), and we may then add them to the carbo-hydrates, and thus obtain the true nutritive ratio. It is on this basis, then, that we must deal with foods. The table herewith gives the principal materials available for poultry-feeding, *showing their composition* as above described. The amount of fats and oils is further shown as multiplied by 2¼ in order that this product may be used for calculating the nutritive ratio.

The method adopted is, multiply fats and oils by 2¼, add carbo-hydrates, then divide the product by the albuminoids; this will give the albuminoid, or nutritive ratio, as shown in the last column.

Articles of Food.	Albuminoids, or Flesh-formers.	Fats or Oils.	Fats × 2¼ = Value in Carbo-hydrates.	Carbo-hydrates.	Salts and Minerals.	Husk or Fibre.	Water.	ve Ratio.
Grains and Meals.								
Linseed-meal	32·9	7·9	17·8	35·4	5·7	8·9	9·2	1 : 1·06
Beans and peas	24·0	1·5	3·4	48·0	2·5	10·0	14·0	1 : 2·01
Malt sprouts	23·2	1·7	3·8	48·5	5·7	10·7	10·2	1 : 2·02
Oatmeal	18·0	6·0	13·5	63·5	2·0	1·5	9·0	1 : 4·03
Middlings	16·0	4·0	9·0	57·0	4·5	4·5	14·0	1 : 4·01
Sunflower-seed	16·0	21·5	48·4	21·4	2·6	29·0	9·5	1 : 4·8
Bran	15·5	4·0	9·0	44·0	6·0	16·5	14·0	1 : 3·5
Oats and ground oats ..	15·0	5·5	12·4	48·0	2·5	19·0	10·0	1 : 4·0
Wheat	12·0	1·8	4·0	70·1	1·8	2·3	12·0	1 : 6·1
Barley (and meal) ..	12·0	1·4	3·2	56·0	3·6	14·0	13·0	1 : 4.9
Millet-seed	11·3	4·0	9·0	60·0	3·0	9·4	12·3	1 : 6·2
Maize	10·5	8·0	18·0	66·5	1·5	2·5	11·0	1 : 8·4
Rye	10·5	1·8	4·0	72·5	1·9	1·7	11·6	1 : 7·5
Buckwheat	10·10	2·2	5·0	62·2	2·0	11·0	12·6	1 : 6·5
Hemp-seed	10·10	21·0	47·2	45·0	2·0	14·0	8·0	1 : 9·0
Sorrel-seed	6·7	3·6	8·1	60·4	1.1	15·5	12·7	1 : 10·4
Dari	9·5	4·5	10·1	68·7	1·5	3·3	12·5	1 : 8·3
White bread	8·8	1·8	4·0	56·4	0·5	..	32·5	1 : 6·8
Rice	6·6	0·4	0·9	80·0	..	..	13·0	1 : 12·3
Brewers' grains	5·4	1·6	3·6	12·5	1·0	3·8	75·7	1 : 3·0
Vegetables.								
Potatoes	6·5	..	..	41·0	2·0	..	50·5	1 : 6·5
Red-clover	5·0	0·8	1·8	13·3	2·4	6·5	72·0	1 : 3·0
Lucerne	5·0	0·8	1·8	13 3	2·4	6·5	72·0	1 : 3·0
Meadow-grass	3·5	1·10	2·2	13·5	2·0	4·7	75·3	1 : 4·5
Meadow-hay	8·4	2·6	5·8	41·0	6·2	27·2	14·6	1 : 5·6
Cabbage	2·4	0·4	0·9	3·8	1·4	1·5	90·5	1 : 1·5
Onions	1·5	0·2	0·5	4·8	0·5	2·0	91·0	1 : 3·5
Turnips	0·5	0·1	0·2	4·0	1·0	1·4	93·0	1 : 8·4
Animal Foods.								
Dry-meat meal	71·2	13·7	30·8	0·3	4·1	..	10·7	1 : 0·43
Flesh of fowls	21·0	3·8	8·5	..	1·2	..	74·0	1 : 0·42
Horse flesh	21·7	2·6	5·8	..	1·4	..	74·3	1 : 0·26
Lean of beef	20·5	3·5	7·9	..	1·6	..	74·4	1 : 0·38
Fresh-cut bone	20·2	26·1	58·7	..	24·0	..	29·7	1 : 2·9
Dried fish	48·4	11·6	26·1	..	29·2	..	10·8	1 : 0·54
Milk	4·0	3·5	7·9	4·8	0·7	..	87·0	1 : 3·2
Skim-milk (separator) ..	3·1	0·3	0·7	5·3	0·7	..	90·6	1 : 2·0
Eggs (yolk only)	16·0	30·0	67·5	..	1·0	..	53·0	1 : 4·2
„ (white only) ..	12·0	2·0	4·5	..	1·2	..	84·8	1 : 0·37

In using the above table to plan a dietary we must first decide as to the proportions that should exist between the various columns, and especially as to the proper nutritive ratio between the albuminoids, and the combined groups of carbo-hydrates and fats and oils. We need not trouble ourselves much about water, or husk and fibre, except in so far as, being valueless in themselves, they affect the real cost of the food; and, although we must see that there are salts enough, we can easily add them where deficient; this is especially necessary for young and growing stock. It is generally held that to maintain animal life the proportion should not be less than 1 : 5. Some authorities consider, more specifically, that there should be about—albuminoides, 18 ; fats and oils, 7 ; carbo-hydrates, 75 ; which works out the same ratio almost exactly, experts differing little in detail.

A similar ratio may be adopted for poultry, but before deciding finally there are two points to consider—firstly, exercise: Cattle lead a very indolent life, as do the majority of men in a less degree. Fowls live a decidedly active life, and it is universally agreed that an active life requires a greater proportion of albuminoids. Still, we shall be quite safe in reckoning 1 : 4½ as a proper ratio in genial weathers, and in winter the same quantity of albuminoids, but an increase of carbo-hydrates, or, still better, of fats and oils, so as to make the ratio 1 : 5, in order to meet the demand on the system during cold weather. Such ratios, as far as the fowls or animals themselves are concerned, should be sufficient, but we have further to consider the daily product of the stock, such as milk or eggs.

Milk contains so much fat and sugar that its own ratio is 1 : 3 or 1 : 3½, so that additional food of the ordinary 1 : 5 ratio with sufficient succulent material to supply fluid may fairly suffice. Eggs, on the other hand, contain as much albuminoids as fat, and to produce an ounce (excluding water) of such rich material is no light task. Hence the need of special food for laying-hens. Such a bird craves for albuminous food, and every breeder knows that while laying she will often devour with eagerness those giant earthworms which when not laying she generally refuses. She *must* get albumen if she is to continue laying eggs, and if the poultryman is alive to his interests he will see that it is provided by a properly "balanced" ration.

FATTENING FOWLS.

Fast them from twelve to twenty-four hours, and then feed them three times a day on soft food, consisting of pollard mixed with milk, oatmeal, barleymeal, or maizemeal, to which add some rendered fat—1 lb. for every fifty fowls. The fattening process will occupy from ten to twenty days. Change their food when they seem to go off it. Give boiled grain, grit, and fresh water.

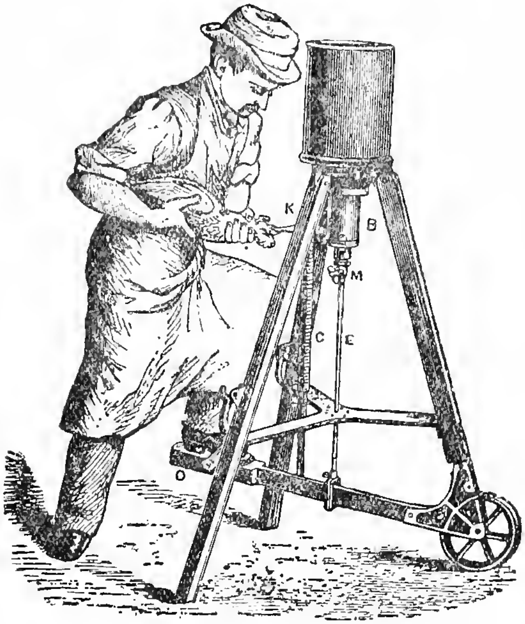
When a large number of birds are to be fattened for the market I would recommend that a cramming-machine be procured for the purpose.

Market the birds when they are between three and five months old. You cannot hope to make a profit on birds sold for the table if you keep them nine or ten months.

If you want to get size in your young stock separate the sexes as early as you can determine one from the other, and a good plan is to put them out in colonies of twenty-five each in movable houses until they are ready to be brought in for the fattening process.

Birds kept in confinement, and fed from a trough with fattening food, will increase from 10 oz. to 15 oz. in a fortnight; if crammed they will put on 5 oz. to 6 oz. more weight.

CRAMMING-MACHINE.



This machine is extensively used in Great Britain to fatten off poultry for the market. The above shows the operator at work. The man's foot is placed on the lever, which, when pressed down, forces sufficient of the thinly mixed food into the crop to fill it. The operation takes about a quarter of a minute to perform.

FATTENING DUCKS, GEESE, AND TURKEYS.

The way to fatten ducks or geese is to place them in a shed, using plenty of straw. Divide geese into flocks of ten or twelve. Ducks may be fattened in larger flocks if necessary. The process of fattening takes about twenty days. Soft food should be given in the morning, served warm, consisting of barleymeal, mixed with Indian meal, sharps, and boiled potatoes, scalded with milk, and add some rendered fat; in the evening wheat, barley, oats, and maize should be given, after it has been steeped in water. Do not fail to supply plenty of sharp grit.

Turkeys must have a dry comfortable shed, and should be fed three times a day for about three to four weeks. The morning meal should consist of ground oats or barleymeal and boiled potatoes mixed with skim-milk, and give plenty of fat during the last fourteen days. Give in the evening wheat, barley, oats, and maize, after being soaked in hot water. Supply the corn each day in the order mentioned.

PREVENTION IS BETTER THAN CURE.

Remember always that to prevent disease in your stock you must keep them perfectly clean and comfortably housed. Do not knowingly breed from stock that has had roup or other diseases or deformity of any description.

KEEP FOWLS OUT OF THE RAIN.

On showery and wet days the birds (if not shut in) will go to roost with damp plumage; the house becomes fusty and unpleasant; the pullets do not come on to lay when they are expected, and many of the stock are seen with colds, and running at the nostrils—a frequent forerunner of roup. Profitable poultry-keeping under such conditions is hopeless and out of the question.

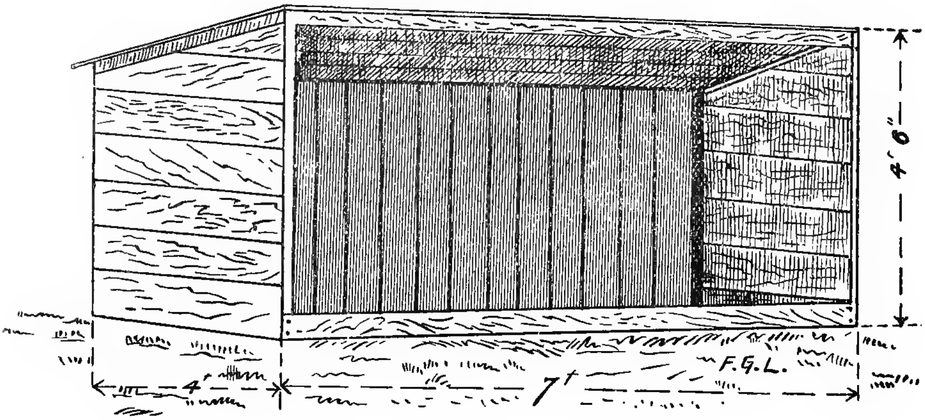
LIMEWASH YOUR FOWLHOUSE.

Twice a year have the interior of your fowlhouse and nest-boxes thoroughly limewashed. Slosh it on and fill all the cracks and crevices, so as not to give the insects room to congregate. The mixture can be made as follows: 1 bushel lime, 1 lb. salt, a pailful of buttermilk, and add just what water is necessary.

INSECT PESTS.

Numerous as are the enemies from which poultry suffer, there are none that cause greater damage than insect pests. Thousands of chickens die owing to their life-blood being sucked out by parasites. Even if they survive the pests they do not grow the size they should. The principal cause is unclean abodes, and crowding too many under one roof. Dust-baths should be provided to enable the birds to rid themselves of vermin.

DUST-BATH.



Scratching Shed or Dust Bath.

Make this most essential provision for your fowls. Spade up a piece of ground, pulverise and mix some ashes with it, and give a good sprinkling of carbolic powder. The dust-bath should be so protected that the rain cannot spoil it, and should face the sun. A dust-bath is as good as a dose of physic; it seems to act as a pick-me-up, and is a terror to vermin.

POULTRY DISEASES AND REMEDIES.

Poultry diseases are brought about by neglect, such as keeping birds in a badly ventilated or draughty building; want of cleanliness; breeding from diseased stock; careless feeding; and by allowing food to lie about and become contaminated by the droppings of unhealthy birds. A bird that dies should at once be burned, or buried deep in the ground. Should a bird die of some infectious disease and be left lying about, the germs will spread in all directions. If any specially valuable birds become ill, isolate them on the first appearance of the disorder, and treat them in the manner described herein. If ordinary birds show signs of sickness, the safest plan is to destroy them at once; this is certainly the wisest course in the end.

ROUP

Is one of the worst contagious diseases that fowls are afflicted with, and unless the affected fowl is very valuable I would recommend that it be destroyed and burned or buried at once. Give close attention to the rest of the flock, thoroughly disinfect the poultry-house, and add iron to the drinking-water. A little sulphur mixed with the soft food is beneficial.

Symptoms: Swelling of the head to such an extent that the eyes are often closed, and a discharge from the eyes and nostrils which is very offensive to the smell.

Treatment: Press the nostrils until they are free from matter. Bathe the head and throat twice each day with a solution of vinegar and water in the proportion of one of vinegar to ten of water, or bathe in the same way with Condy's fluid. Give a teaspoonful of castor-oil and 1 gr. quinine pill night and morning. Birds affected should be isolated, and kept in a warm, dry shed.

The following are also good remedies: One-fourth teaspoonful of pepper, three-fourths milk: to be given twice a day. A teaspoonful of sweet oil, one ditto kerosene, four drops carbolic acid; mix, and inject a few drops into the nostrils. Apply with a small oil-can or syringe, and put a little camphorated oil on affected parts. One tumbler full of vinegar, one-fourth water, one teaspoonful of cayenne pepper, mix thoroughly, and give each bird one teaspoonful three times a day.

CHOLERA.

This is a contagious and deadly form of diarrhœa. The affected fowls mope about; the discharge from the bowels is of a watery nature and particularly offensive. Remove all the birds affected from those which appear healthy; scald out all the drinking-vessels and give water with a few drops of laudanum; give boiled rice and a sprinkling of powdered chalk. If the case is very aggravated, give a pill made up as follows: Opium, 2 gr.; rhubarb, 3 gr.; powdered chalk, 3 gr. Give this pill once daily.

CRAMP.

This is brought about through the fowls being kept in a damp place. The feet become contracted and the birds cannot stand. Remove to a warm place, rub the legs with embrocation or turpentine, and give warm food with cayenne pepper or powered ginger.

CROP-BOUND.

This is a complaint that can easily be cured. It is caused very often by birds being without green food for a length of time, then feeding off long grass and hard corn, which causes the crop to swell. Get an assistant to hold the bird on its back between his knees; the operator will then hold the crop in the left hand, remove a few feathers, and with a sharp knife make a cut about ¾ in. long and remove the contents of the crop with an egg-spoon; put a couple of stitches in the crop, and place the bird in a coop for two days, and give only soft food; it will, in nineteen cases out of twenty, be all right again in that time.

GAPES.

The symptom of this complaint is continual yawning. This disease is generally confined to young chickens. It consists of small red worms in the windpipe. Extract the worms by passing a wing-feather down the throat, and then give a gentle turn two or three times, and then withdraw carefully, when, on examining the feather, there will often be three or four worms on the end of it. Put a piece of camphor the size of a walnut in the drinking-water, replacing the camphor when fresh water is given.

LEG-WEAKNESS.

This is an affection which attacks young birds of the heavy breeds. Parrish's chemical food is the best remedy. Give one teaspoonful to a pint of water well mixed, and reduce stimulating food.

APOPLEXY.

This is chiefly caused by overfeeding; maize used frequently will bring on this deadly complaint. Hens will often die from this if chased. Administer a dose of Epsom salts, a quarter of a packet for each bird, and feed on rice and other soft food.

SNEEZING.

A good remedy for fowls that sneeze, owing to a cold in the head, is to put one tablespoonful of kerosene in a pint of drinking-water.

DISEASE OF THE EGG ORGANS.

When a hen becomes egg-bound, pass a well-oiled feather into the vent and about the edge of the aperture; if the egg does not soon come away, hold the bird with the vent over a jug of boiling water for a few minutes. If these measures do not succeed, place the bird on its back between your knees, with your finger and thumb of the left hand outside the bird's body; push the egg carefully towards the vent until it slightly protrudes, then prick the end of the egg to liberate its contents; carefully break the egg-shell and take it away, oil the finger and pass it into the vent and make sure all the pieces of shell are taken out.

SCALY LEGS

Is caused by a minute parasite. Bathe well with hot water, and rub on a mixture of kerosene, sulphur, and lard. The mixture should be about the consistency of paint; a few applications will usually suffice.

ERUPTION ON COMB.

When an eruption breaks out on a bird's comb, give half a teaspoonful of castor-oil. Rub the affected part lightly with olive-oil, in which should be mixed six drops of carbolic acid. Give the bird plenty of green food.

TWENTY "DON'TS" FOR POULTRY-KEEPERS.

Don't fail to gather eggs twice a day.

Don't take eggs to market unless they are clean and inviting.

Don't forget eggs are porous, and contaminating surroundings will spoil them.

Don't forget if a brooding hen is allowed to sit on a fertilised egg for twelve hours the flavour is spoiled.

Don't forget that the sooner eggs are marketed the better.

Don't forget that the flavour of the egg is affected by the quality of the food given to hens.

on't keep a male bird with hens that are not required to breed from.

Don't allow hens to eat decayed vegetable or animal substances.

Don't keep the water in the sun; it should be always sweet and clean.

Don't forget sharp grit is teeth to poultry.

Don't feed poultry at irregular intervals.

Don't have filthy nest-boxes; keep them limewashed, and have clean hay, straw, shavings, or pine-needles in them.

Don't fail to have two or three nest-eggs in each nest; it goes a long way to prevent fowls eating their eggs.

Don't have perches nailed or built in step-ladder fashion, but have them on a level 12 in. to 18 in. from the ground.

Don't forget to breed from your best layers only.

Don't fail to fill your incubator and brooder lamps daily.

Don't send to the export depots birds that are not in good condition.

Don't fail to work up a private trade if possible.

Don't fail to keep a record of the eggs laid during the year.

Don't neglect keeping fowlhouses dry, clean, and free from vermin.

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